MAKING TIME IN MUSIC
an international conference

12-14 SEPTEMBER 2016
FACULTY OF MUSIC
UNIVERSITY OF OXFORD
Welcome

A very warm welcome to the Faculty of Music at Oxford and to Making Time in Music. We look forward to three days of papers and discussions that explore questions of time, timing and temporality in music.

We deliberately cast the net wide in selecting papers, and the conference brings together diverse and, at times, oppositional readings of musical time. Historical, psychological, socio-cultural and philosophical approaches to humanly organised time are all present and we hope that this sets off various dialogues between scholars both in the sessions and more informally.

We would like to thank all of our presenters for their anticipated contributions. The quality and diversity of the submissions was such that we quickly decided to extend the conference from two to three days, and change our original plan for a plenary event to one of parallel sessions. Even with our extending the capacity of the conference, there were many excellent papers that for reasons of time (!) and balance could not be given the space that they deserved. Our thanks also go to the many scholars who took the time to submit a paper but whose proposals we could not include.

It is a special pleasure to welcome Professors Georgina Born and Vijay Iyer to Making Time as our invited speakers. Their presence at the event, given their fairly relentless writing, speaking and, for Vijay, performance commitments, is particularly appreciated.

We are grateful for the generous support of the Leverhulme Trust, which does so much to foster arts and humanities scholarship in the UK. Finally, thanks are due to all our colleagues in the Faculty for their encouragement, and for making the event possible in the first place.

Best wishes

Mark Doffman, Emily Payne, Jonna Vuoskoski, and Toby Young

Conference Committee
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Conference schedule at a glance

- Parallel sessions: A sessions will take place in the Denis Arnold Hall; B sessions will take place in Lecture Room A.
- Plenary sessions will take place in the Denis Arnold Hall.
- The poster session will take place in the JCR and the Committee Room.
- Tea and coffee breaks and lunches will be provided in the JCR and the Committee Room (included in registration fee).
- The conference dinner will take place on Monday 12 September at Pembroke College (pre-booking is required).

Day 1: Monday 12 September

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<tr>
<th>Time</th>
<th>Session A1</th>
<th>Session B1</th>
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<tr>
<td>09:00</td>
<td>Registration (a welcome desk will be open in the Faculty reception area from 09:00)</td>
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<tr>
<td>11:00</td>
<td>Welcome</td>
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<td>11:30–13:00</td>
<td>Multimodal communication of time in ensemble performance Renee Timmers (University of Sheffield)</td>
<td>Music as time, music as timeless Kristina Knowles (Arizona State University)</td>
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<td>Studying musicians’ gaze behaviour in the light of synchronisation issues in ensemble playing Sarah Vandemoortele, Stijn De Beugher, Geert Brône, Kurt Feyaerts, Toon Goedemé, Thomas De Baets, and Stijn Vervliet (LUCA School of Arts and KU Leuven)</td>
<td>Politicking musical time Chris Stover (The New School)</td>
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<td>Coordination in vocal ensembles Ryan Kirkbride (University of Leeds)</td>
<td>Distracted timekeeping Anthony Gritten (Royal Academy of Music)</td>
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<td>Lunch</td>
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<td>Time</td>
<td>Session A2</td>
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<tr>
<td>14:00–15:30</td>
<td>Psychology I [Chair: Anthony Gritten]</td>
<td>MetroRhythmTempo I [Chair: Emily Payne]</td>
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<td>Timescales and temporal ranges: an enactive and dynamic approach to temporality in musicking Juan Loaiza (Queen’s University Belfast)</td>
<td>Tempo, drive and identity in Cape Breton traditional fiddle music David Kirkland Garner (University of South Carolina)</td>
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<td>Ensemble performance from a systems-theoretical perspective: opportunities and challenges Marc Duby (University of South Africa)</td>
<td>‘Just in Time’: Herbert von Karajan as an interpreter of Mozart’s <em>Requiem</em> Karina Zybina (University Mozarteum, Salzburg)</td>
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<td>Rhythm in music: a comparative perspective John C. Bispham (University of Cambridge)</td>
<td>Room for interpretation: musical tempo in variable acoustics Sverker Jullander, Petter Sundkvist, Jan Berg, Helge Kjekshus, Karin Nelson (Luleå University of Technology and Norwegian Academy of Music)</td>
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<td>15:30</td>
<td>Coffee/tea</td>
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<td>16:00</td>
<td>Invited paper: Vijay Iyer (Jazz pianist/composer and Harvard University) Reassembling the temporal [Chair: Jason Stanyek]</td>
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<td>17:00</td>
<td>Short break</td>
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<td>17:15–18:45</td>
<td>Session A3</td>
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<td>MetroRhythmTempo II [Chair: Satinder Gill]</td>
<td>Temporality and History I [Chair: Toby Young]</td>
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<td>Timing and emotional transformation in Arab music as manifested in a Sufi ritual <em>dhikr</em>, and the <em>wasla</em>, a secular musical suite Guilnard Moufarrej (United States Naval Academy)</td>
<td>Temporal multiplicities: the impact of early cinematic technologies on musical temporality, 1913 Paris Ellen Davies (University of Oxford)</td>
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<td>Metric displacement and group interaction in “Evidence” by the Thelonious Monk Quartet Ryan Bruce (University of Guelph)</td>
<td>A Bergsonian unfolding of time: the paired love duets in Puccini’s <em>La Fanciulla Del West</em> Kae Fujisawa (The Graduate Center, City University of New York)</td>
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<td>Cultural and individual particularity on the canvas of the metrical hierarchy John Paul Ito (Carnegie Mellon University)</td>
<td>Brahms’s <em>German Requiem</em> and the politics of time Francis Maes (University of Ghent)</td>
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<td>19:30</td>
<td>Conference dinner, Pembroke College</td>
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### Day 2: Tuesday 13 September

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<tr>
<th>Time</th>
<th>Session A4</th>
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<tr>
<td>09:30–11:00</td>
<td><strong>Interpersonal II</strong></td>
<td><strong>Temporality and History II</strong></td>
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<td>[Chair: Rolf Inge Godøy]</td>
<td>[Chair: Georgina Born]</td>
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<td>Consort music performance and synchronization</td>
<td>Spectra of Marx: the temporality of revolution in the music of Gérard Grisey</td>
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<td>Alon Schab (University of Haifa)</td>
<td>Naomi Woo (University of Cambridge)</td>
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<td>Alec Cooper</td>
<td>Samuel Wilson (Guildhall School of Music and Drama / London Contemporary Dance School)</td>
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<td>(University of Edinburgh)</td>
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<td>The devil is in the detail – rich representations of a partner’s contribution facilitate temporal coordination in joint music performances</td>
<td>Stretching time: ‘As Slow As Possible’</td>
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<td>Thomas Wolf, Natalie Sebanz, and Günther Knoblich</td>
<td>Diane Luchese (Towson University)</td>
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<td>(Central European University)</td>
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<td>11:00</td>
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<td>11:30–13:00</td>
<td><strong>Session A5</strong></td>
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<td><strong>MetreRhythmTempo III</strong></td>
<td><strong>Psychology II</strong></td>
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<td>[Chair: Timo Fischinger]</td>
<td>[Chair: Renee Timmers]</td>
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<td>Northern additivities? Questions of conceptualization and typologization of structures of performed musical time and tonality – exemplified by data-oriented research of North Scandinavian and West Siberian indigenous musical traditions</td>
<td>The effect of backbeat on metrical hierarchy and tempo perception in rock music</td>
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<td>Jarkko Niemi (University of Tampere) and Marko Jouste (University of Oulu)</td>
<td>Bryn Hughes (University of Lethbridge)</td>
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<td>‘For signs and for seasons and for days and years’: hierarchies of musical and textual rhythm in Steve Reich’s Tehillim</td>
<td>Towards a cognitively-based quantification of metrical dissonance</td>
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<td>Martha Sullivan (Rutgers University)</td>
<td>Mark Gotham (University of Cambridge)</td>
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<td>The ideality of time in music</td>
<td>How can a performer shape experience of time for an audience?</td>
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<td>Roger Redgate (Goldsmith’s College, University of London)</td>
<td>Michelle Phillips (University of Cambridge/Royal Northern College of Music)</td>
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<tr>
<td>13:00</td>
<td><strong>Lunch</strong></td>
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| 14:00–15:00 | **Poster Session**  
Dancing to the beat of another: an exploration of empathy and entrainment on the social dance floor  
Joshua Bamford (University of Jyväskylä)  
Timekeeping or time feeling?  
Olivier Fluchaire (Manhattanville College)  
Microtiming and anisochronous meters in Afro-Brazilian music: didactic issues induced by an alternate way to “think” time in music  
Gérald Guillot (Lausanne-CH / Paris-Sorbonne University / PESMD Bx Aquitaine)  
A phenomenological approach to the social aspects of trancing in shaping Korean shamanic ritual music in time  
Jin Hyun Kim (Humboldt-Universität zu Berlin) and Mikyung Lee (Chonnam University/Korea)  
Eighteenth-century London, conflicting soundscapes, and the imposition of silence  
Micah Anne Neale (Royal Holloway, University of London)  
The culture of Japanese time in the music of Toshi Ichiyanagi  
Yoojin Oh (College of Staten Island/City University of New York)  
Marking time: tempo, rhythm, power and pleasure in Ulster Loyalist marching bands  
Gordon Ramsey (Queen’s University Belfast)  
Brain bases of perception and working memory for time intervals in rhythmic sequences  
Sundeep Teki (University of Oxford)  
Breathing in music  
Finn Upham (New York University) |
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<td>15:00</td>
<td><strong>Coffee/tea</strong></td>
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| 15:30–17:00 | **Session A6**  
Psychology III  
[Chair: Eric Clarke]  
Rhythm as gestalt  
Timo Fischinger (Max Planck Institute for Empirical Aesthetics)  
Inertia and gesture in embodiments of time  
Randall Harlow (University of Northern Iowa)  
Understanding the musical instant  
Rolf Inge Godøy (University of Oslo)  
**Session B6**  
Temporality and History III  
[Chair: Michelle Phillips]  
Maelzel’s metronomic progeny  
Alexander Bonus (Bard College)  
10, 11, 12 and 13½ bar blues: reflections on African-American country blues recordings (1925-38)  
Andrew Bowsher (University of Oxford)  
The everyday politics of musical time in the ballet world  
Jonathan Still (Institute of Education) |
<p>| From 17:00 | <strong>Free time</strong> |
| 21:00 | Social evening and low-key jam session, Spin Jazz Club (open to all) |</p>
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<tr>
<th>Time</th>
<th>Session A7 Sociality</th>
<th>Session B7 Technology</th>
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| 09:30–11:00 | It don’t mean a thing: the rhythm section and considerations of ‘hot’ and ‘cool’ in the music of Lennie Tristano  
Marian Jago (University of Leeds) | Temporal impacts of music streaming technology on the listening experience  
Geoff Luck (University of Jyväskylä) |
| | Matters of taste and time in Anatolian Greek music  
Panayotis League (Harvard University) | On the grid: a socio-technical perspective on the digital quantization of musical time  
Landon Morrison (McGill University) |
| | Listening to North Indian classical music and the distribution of affect over time  
Chloë Alaghband-Zadeh (University of Cambridge) | Metonymic groove: the breakbeat as time capsule  
Rowan Oliver (University of Hull) |
| 11:00 | Coffee/tea |
| 11:30–13:00 | Session A8 Philosophy II  
[Chair: Toby Young] | Session B8 Interpersonal III  
[Chair: Jonna Vuoskoski] |
| | To be in time: repetition, temporality, and the musical work  
Nathan Mercieca (Royal Holloway, University of London) | Palaran: flexibility, coordination, and control of timing in a Javanese, multi-player accompaniment genre  
Jonathan Roberts (Universities of Oxford and Cardiff) |
| | Layers of musical time in progressive rock songs  
Nick Braae (Waikato Institute of Technology) | Synchrony, sociality, and collective performance from the lab to the field: some evidence from the Sultanate of Oman  
Bradford J. Garvey  
(City University of New York) |
| | The perception of metre: Hasty’s theory of projection meets Husserl’s structure of time consciousness  
Philip Boast (University of Nottingham) | The art of conversation: timing and gesture in ensemble performance  
Satinder Gill and Sheila Guymer (University of Cambridge) |
| 13:00 | Lunch |
| 14:00–15:30 | Invited paper: Georgina Born (University of Oxford)  
Making time, crossing scales: music, temporality, history, listening  
Conference summary led by Mark Doffman (University of Oxford) |
| 15:30 | Coffee/tea |

END OF CONFERENCE
Dancing to the beat of another: an exploration of empathy and entrainment on the social dance floor
Joshua Bamford (University of Jyväskylä)

As theories about the origins of music are discussed, the importance of rhythm and movement is beginning to be recognised. One function that music seems to provide is that of social bonding, although whether shared timing of musical or dance activity is important, and the mechanisms involved, are not well understood. This presentation will explore the role of empathy and entrainment through two studies.

The first asked individual participants to move freely to a range of musical stimuli. There were rapid changes between different musical stimuli, and the time taken for participants to resume rhythmic movement after the change was measured. A negative relationship was found between Trait Empathy of participants and the measured break in movement.

The second study involved dyads wearing headphones in a ‘silent disco’ scenario. They were presented with music in either the same time, with different tempo, or out of phase. Participants subjectively rated the interaction they had with their partner as better in the synchronous condition, an effect that was more pronounced for participants with higher Agreeableness (a trait related to Empathy). Motion capture analysis was also used to examine how dyads synchronised with each other in the face of incongruent stimuli.

These two studies suggest that moving in time with others builds feelings of social affiliation, a process mediated by Trait Empathy and Agreeableness; traits which may be important to both our ability and enjoyment of entrainment. This supports literature suggesting that music’s ability to bring us in time with others is fundamental to how it brings us together. Consequently, we may theorise about the role music plays in society, both today and earlier in our evolutionary history, and the neurological mechanisms involved in both rhythmic entrainment and empathetic processes.

Timekeeping or time feeling?
Olivier Fluchaire (Manhattanville College)

Performing chamber music offers one of the most fascinating and challenging relationships between timekeeping and expressive aims. Expressiveness in music can be achieved by using a palette of tools based on dynamics and tone quality in conjunction with time. The pulse, the heartbeat of music, stays constant; it may accelerate or slow down but stays present, yet the feeling of that pulse has a life of its own as interpreted by a group of chamber musicians. Never exactly duplicated from one concert to another, the intricate and subtle changes of time shape music during a performance as it works alongside the natural flow of the given musical logic.

It is common for student groups to rehearse with a metronome or for ensembles to record a movie soundtrack using a click track. Do these devices disturb the natural flow of the pulse? Could technology allow flexibility within the beat? Can timekeeping and expressiveness work hand-in-hand?

The purpose of this paper is to examine the life of the pulse within a chamber music setting and to consider the challenges and/or benefits of automatic timekeeping machines (metronomes). For this paper, the study will concentrate on string quartet music. It will outline the social aspect of keeping time in an equal partnership situation and the singularity of sharing and feeling the pulse as a group. Methodology will include surveying historical performance practice and its relation to timekeeping and creating a visual graph of audio recordings showing the life of the pulse compared to that of a metronome.
The analysis of performances pertaining to the corpus of Afro-Brazilian music reveals a musical organization generally composed by recurrent temporal patterns, called fundamental traits or “characteristic devices” (Pressing, 2002), which could reveal the influence of the Bantu and Yoruba ways of “thinking” time in music (e.g. Kubik, 1979; Mukuna, 1979; Sandroni, 1997; Capone, 2000; Fryer, 2000; Vatin, 2005).

Two of these kinds of temporal organization don’t exist in the Western music and induce didactic issues (Guillot, 2004; Guillot, 2005):

The first one is the fast pulses’ microtiming, sometimes called *swing*, *suíngue baiano* or *suíngue brasileiro* (Browning, 1995; Baptista, 2002; Lucas, 2002; Gerisher, 2006; Gouyon, 2007). Guillot (2011) showed that its transmission in France (and probably, in the entire Western world) is impeded by a cognitive filtering (Lieury et al., 2004) based on perceptive/auditory expectations (Huron, 2006) built by enculturation.

The second one is a complex structure composed of simultaneous “rhythmic lines” (Graeff, 2014). Some of them, isochronous, are embedded in the dance movements (Naveda, 2011). The others work as implicit “time-line patterns” (N’Ketia, 1961) for instrumental and vocal performance and can be considered as “non-isochronous meters” (London, 2004).¹

This paper will give an overview of the literature dealing both with the performance, the cognitive perception and the ability to elaborate pedagogical program in order to teach Western students an alternate way of “thinking” time in music based on such temporal organizations.

¹ Or « anisochronous meters».

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**A phenomenological approach to the social aspects of trancing in shaping Korean shamanic ritual music in time**

Jin Hyun Kim (Humboldt-Universität zu Berlin) and Mikyung Lee (Chonnam University/Korea)

Music is shaped in (inter)action running its course towards a close in temporal irreversible succession; the course is suggested by the musicians’ desire, which creates a goal for that action varying according to the context in which the process of musical shaping is situated. This action is guided by the act of *memoria* (Augustine) linking the moments already passed, and to follow, which is conceived of not only as intra-temporal, but also as intermental. This paper investigates different forms of trancing in Korean shaman rituals related to the so-called ‘jangdan”—a long temporal unit of Korean traditional music organised by a characteristic rhythmic pattern, viewed as the unit of energy-flow, which Korean musicians share and play their individual parts in a relatively independent manner, taking typical procedures of Korean shaman rituals including intense periods of drumming, dancing, and singing into account. Methodologically, a phenomenological interview technique that was developed in the mid-1990s within the scope of a neurophenomenological research program was used to interpret audio data. This interview technique allows for retrospection directly related to shamans’ and musicians’ first-person experience that has just taken place at that point of ritual and for analysis of the temporal structures of this experience. For interview questions, musical units analysed during each ritual were used as a reference point. The interviewed shamans reported that they attained trancing, being entrained and attuned to other musicians in shaping music together in time. Their trancing largely depends on the entraining and complementing roles of drumming. The former becomes obvious in temporal alignment between drumming and singing in important beats of jangdan. The latter is manifested by a drumming beat complementing the last beat of a unit of ritual song (‘taryeong’) or a spirit’s words (‘gongsu’). The social aspects of trancing in Korean shaman rituals, therefore, deserve careful discussion.
Eighteenth-century London, conflicting soundscapes, and the imposition of silence
Micah Anne Neale (Royal Holloway, University of London)

Eighteenth-century London manifested a number of ongoing class disputes over urban spaces, soundscapes and time. The carving out of Oxford Street as a middle-class commercial hotspot, for example, through reconstruction, demolition, driving away undesirable elements, and rerouting traffic, illustrates vivid concerns over controlling social flow and, especially, noise. Local meat markets were considered a noisy nuisance; the steel-rimmed carriages of the wealthy screeching over newly-laid flagstones were a sign of progress. Meanwhile, the thin walls and dense population of poor neighbourhoods created interconnected enclaves of community, formed by the uncontrolled interpenetration of residents' sounds.

The musics of contemporary London were another frontier for such conflicts over social space and time: in 1788, for instance, Vauxhall Gardens received numerous complaints about "improper" admissions to the concerts held therein. Hogarth's famous 1741 print The Enraged Musician likewise centres music as a battleground for social control, with a wealthy musician's efforts being frustrated by oblivious street musicians. His flow, his musical timing, is impeded by the multivalent rhythms of the lower orders.

As such, uninterrupted, singular musical time represented a prized commodity for the wealthy of eighteenth-century London. Acquiring the silence required for an informal domestic chamber music evening, such as those described by Frances Burney, necessitated an exclusion of the sounds of the poor; yet it was this very exclusion which generated prestige. Conversely, the dense soundscapes of poorer neighbourhoods precluded such mutually exclusive readings of musical time – the music performed in such spaces being subject to several layers of conflicting sounds.

My paper will examine how these different attitudes to musical time manifested themselves in musical practice for wealthy amateurs and elite professionals, but also seeking insight into the practices of humbler musicians.

The culture of Japanese time in the music of Toshi Ichiyanagi
Yoojin Oh (College of Staten Island/City University of New York)

The concept of time has been one of the major governing factors in Japanese cultural/social phenomenon. Stemming from the traditional Japanese idea of "Ma" (the interval between spatial and temporal objects and events), the music of Toshi Ichiyanagi (b. 1933) demonstrates such a tacit feel for time as a coherent basis of musical language based on one's affinity for his/hers own tradition.

As a disciple and core collaborator of John Cage, it was the Cage-inspired indeterminacy and anti-rationality that opened the door to Ichiyanagi's experimental avant-garde compositional style from the 1950s to the early 1970s. Following that period, Ichiyanagi's rediscovering of the perception of Japanese "time", and its inseparable counter partner "space", allowed him to establish his stylistic modification reflecting rather conventional musical idioms in his post avant-garde period.

One of Ichiyanagi's duo works for violin and piano, Interrelation (1998) is a single movement work in which the idea of "time" progress is clearly narrated, juxtaposed with "space" that is rather a four-dimensional being. In his program notes for that piece, Ichiyanagi explains,

"The special feature about this duo piece is that the relationship between the two instruments is not one of closeness but one of spaciousness that is created by the different distances taken by the two instruments. [...] There, time progresses in different ways, not only horizontally but rising in a spiral shape, staggering, multiplying and making playful excursions."

This paper will examine the Japanese concept of time and space and its influence on Ichiyanagi's music through the study of his selective duo works for violin and piano. The paper will further examine how Ichiyanagi's conceptualization of cultural time delineates his deliberate use of unmeasured canvas where a clear textural distinction based on progression of contrasting materials results in a formal structure.
Marking time: tempo, rhythm, power and pleasure in Ulster Loyalist marching bands
Gordon Ramsey (Queen's University Belfast)

Parading to music has been significant to social and political life in Ulster for over two centuries. Whilst both supporters and detractors of parading tend to characterise it as timeless and unchanging, historical evidence shows that embodied practices of parading have been repeatedly transformed throughout this period, and parading bands today are extraordinarily diverse in their musical styles. This paper shows how changes in musical tempo and rhythm can be correlated with changes in the types of relationship that emerge in musical performance as a result of social, economic and political changes in northern Irish society. I chart the musical rhythms that dominated Ulster parades from 18th century fife & drum ensembles, moving at the ponderous 'common-step', to the emergence in the 19th century of the Lambeg ‘drumming party’ and the evolution of a ‘freeform’ percussion style, before the ‘dander’ of the drumming party was marginalised by the quick-step of the marching flute band in association with urbanisation and industrialisation at the turn of the 20th century. I briefly note the development of the concert band from the marching band, before describing the musical disjuncture occasioned by the emergence of ‘blood & thunder’ rhythms, associated with political violence, deindustrialisation and working-class alienation in the 1970s. I conclude by showing that the diverse forms of ‘marking time’ that coexist in the loyalist band scene today correlate with different conceptions of musical pleasure and the pursuit of different forms of social and cultural capital in Northern Ireland’s fragmented post-conflict and post-industrial society.

Brain bases of perception and working memory for time intervals in rhythmic sequences
Sundeep Teki  (University of Oxford)

Music contains sequences of time intervals spanning from a few tens to hundreds of milliseconds. How the human brain represents time in the absence of dedicated neural machinery is an intriguing problem in neuroscience.

I will present evidence from human behavioral and brain imaging experiments that highlight the role of distinct brain regions that form part of the motor system of the brain, in mediating perception and memory of time intervals in rhythmic sequences with variable levels of temporal regularity.

In the first study, participants were asked to perceive the difference in duration of two successive time intervals as a function of the preceding context of either an irregular sequence of sounds (where the task relies on encoding the absolute duration of time intervals), or an isochronous sequence of sounds (where intervals can be timed relative to the isochronous beat). Brain imaging data measured during the task using functional magnetic resonance imaging (MRI) revealed spatially segregated activations in two distinct subcortical motor areas: the cerebellum, which was more active during the timing of irregular sequences, and the basal ganglia, that were more active for timing regular sequences. These data suggest that perception of time depends on the context and relies on distinct mechanisms and brain areas.

The next study explored the question whether intervals of time can be stored in memory as distinct items, as is the case for visual objects. Participants were required to reproduce the duration of a single probed interval from a sequence of intervals. Results indicate that memory performance significantly varies as a function of temporal structure (better memory in regular vs. irregular sequences), interval size (better memory for sub- vs. supra-second intervals), and memory load (poor memory for higher load). These results support the emerging hypothesis that time intervals are allocated a working memory resource that varies with the amount of other temporal information in a sequence.
Breathing in music
Finn Upham (New York University)

Our breath marks time for the entirety of our lives. Whether a period of 2 seconds or 20, we know roughly how it will continue or be adjusted to new demands, and this need for fresh air imposes an inescapable rhythm just beyond what is readily heard as metrical. We use breath to communicate with speech and affective displays, but we also monitor each others’ breathing and use this information to coordinate interactions: breathing in anti-phase when in dialogue, or together when synchronising actions. Obviously, musical activities such as singing and playing wind instruments involve exhalations and the particular physical constraints of our respiratory system. Other components of breath are used to prepare and set the timing of actions. For example, the inhalation at the beginning of a piece defines tempo and intensity for many solo performers and small ensembles, and some types of musicians are extremely practiced at picking up all that is needed to play in synch from one careful gasp. We might consider breath to be auxiliary to the actions of music making, just a means to the sound, but this biological system may be play a fundamental role in our understanding of music and musical time. There is growing evidence that listening to music can engage our respiratory system, drawing us into a specific physical division of time. This coordination is not so strict as breathing with the heard performers, but rather a subtle alignment of phase at specific moments in a particular piece. For this to occur, even intermittently, our respiratory system must be engaged in the work of understanding what we hear. Voluntarily or unconsciously, breathing informs synchrony on the scale of milliseconds, seconds, and minutes, and this phasic and adaptive system promises to be powerful in defining musical time both physically and metaphorically.
In live music performance, time is marked visual-spatially in the movements of performers as well as auditory in the performed sounds. Even if these visual-spatial movements are primarily related to necessary actions for the production of sounds, they may function in a communicative manner, visually representing temporal aspects of the performance. Experimental psychological studies have shown a strong cross-modal correspondence between time and visual space, and between time and visual motion. The objective of this study is to examine ways in which such correspondences between time and visual space and between time and visual motion are employed in inter-performer communication. This is done in two stages: The first stage examines parallels between auditory and spatial/motional markers of time by analysing hand movements of a pianist performing brief musical sequences. Parallels are explored between elapsed time and the length of motion or traversed space, as well as parallels between auditory and visual-spatial marking of time - starting and ending an event, anticipating and delaying an event, and marking the relative importance of a time division. In the second stage, musically trained participants synchronise with the audio-visual presentations of the (in the first stage) recorded musical performances, under auditory only conditions, full audio-visual conditions in which hand movements and sound are presented, and abstract audio-visual conditions that shows abstract visual motion (showing a moving dot rather than a hand) along with the auditory information. The usefulness of the auditory-visual information for co-performer synchronisation is tested with the particular interest to examine whether or not full-hand displays are more effective than abstract visual displays, distinguishing motor-representations of time markers from more purely visual-spatial markers.

* This study was conducted as part of a visiting research position at the MARCS Institute, University of Western Sydney, Australia.

Studying musicians’ gaze behaviour in the light of synchronisation issues in ensemble playing
Sarah Vandemoortele, Stijn De Beugher, Geert Brône, Kurt Feyaerts, Toon Goedemê, Thomas De Baets, and Stijn Vervliet (LUCA School of Arts and KU Leuven)

The communicative behaviour of musicians is multimodal: it involves gaze behaviour, gesture and musical sound. This study focussed specifically on the function and timing of interactive gaze behaviour in musical duos. As the results show, gaze behaviour may shed a unique light on how musicians deal with synchronisation issues.

The interest in musicians’ gaze behaviour, insofar it is unrelated to music reading, is rather new. So far, studies have dealt with the relationship between gaze behaviour and the musical score (Williamon & Davidson 2002, Davidson 2012), the social aspects of gaze behaviour in ensemble performance (Kawase 2014a) and gaze behaviour in the light of synchronisation issues (Kawase 2014b). A pilot study has been undertaken in which we studied three musical duos of divergent constellations. Not only was the aim to test a new research design (using mobile eye-tracking), but we also endeavoured to open up the field to further research, disclosing a wide range of new research questions and hypotheses regarding ensemble playing.

Some of the findings suggest the following: Gaze behaviour has an important role to play at moments of ‘role switching’ (i.e. when melody and accompaniment reverse or when fast and slow rhythmic values reverse) and around periods of ‘inactivity’ (i.e. rests or long notes) by one of the musicians. In order to further disambiguate the gaze results we included a multimodal analysis in our method that focusses on actual timing issues in the audio files and on bodily gesture.

In the presentation we plan to provide
- an explanation of the design and the analysis method,
- an overview of the results and newly generated questions and hypotheses, focussing on the way musicians’ gaze behaviour may be related to synchronisation issues.
Ensemble performance is a musical endeavour that requires both interpersonal and multimodal coordination. The movements used by musicians to coordinate their performances are known as communicative gestures and can be categorically separated from the movements required to play their instruments. These are often referred to as soundproducing or instrumental gestures and directly relate to the manipulation of materials in order to move particles in the air and create sounds. Vocal performances, however, do not require any manipulation of external materials and sound can be created with almost no visible movement, but rarely is this the case.

This paper is part of an exploratory investigation into the role of physical gestures in vocal ensembles, namely barbershop quartets. The data for this study will be collected using the Microsoft Kinect threedimensional motion capture technology, which automatically tracks up to six bodies simultaneously. To measure how movement is used as a timekeeping device participants are asked to perform with three different levels of expressive intent; normal, deadpan, and exaggerated. Research has shown that these interpretations have resulted in statistically significant changes in the quantity of movement and the quality of performance. As the level of expressivity increases, so too does the amount of variation in note interonsetintervals and tempo is more frequently manipulated by means of rubato. The differences in the ensemble motion profiles will be correlated with the group's temporal coordination to explore the how these expressive variations are managed as a group. Data collection is currently ongoing and will be used in conjunction with qualitative analysis of questionnaires and interviews, to examine how ancillary movements in groups of singers are used in an expressive capacity to achieve temporal coordination. Findings will be presented at the conference.
Session B1  
Philosophy I  

Music as time, music as timeless  
Kristina Knowles (Arizona State University)

A common assertion by music scholars and performers alike is the ability of music to evoke a perception or experience of timelessness, a sense of "time out of time." Within scholarship by music theorists, such claims are often associated with specific moments within musical works, and are woven together along with other observations pertaining to musical structures as part of the construction of an interpretation or argument for perception in relation to the musical passage in question. Despite the frequency with which notions of timelessness, stasis, or temporal suspension are associated with music, some scholars have pushed back against the use of these terms in relation to music, noting that music is inherently temporal (Epstein 1981).

In this paper, I explore the tension between music as a temporal art form that exists only in and through the unfolding of time and the belief that music is capable of evoking "static temporality" through the dual lens of philosophy and psychology. In doing so, I seek to uncover the differing claims underlying these notions, parsing out ascriptions of timelessness in music that have cultural origins and are grounded in specific types of structures, such as the concept of lyric time discussed by topic theorists (Monelle 2000; Klein 2004), and those that relate to perceptual mechanisms which often result in a subjective experience interpreted as a moment of temporal stasis. By understanding the different origins of these assertions and the ways in which our interpretation of ongoing perception influences our conceptual notions of time (Reiner 2000), it is possible to arrive at a more fine-tuned understanding of the experience of timelessness in music.

Politicking musical time  
Chris Stover (The New School)

Like all relationships, musical relationships are temporal phenomena. Any attempt to reduce a musical event away from the flux of its emergent temporal existence (to ascribe to it ontological status as a fixed thing, for example) distorts its fundamental character. Likewise, any attempt to remove a musical event from the ecological conditions of its essential relationality to other events is equally misrepresentative. These are lessons that come to us from process philosophers from Bergson and Whitehead to Deleuze. In this paper, I propose a model for thinking through musical identity that begins with these two foundational concepts: temporal emergence and relationality. I argue that these are not only ontological concerns, but also political ones. The kind of politics that I will engage is twofold, involving on one hand the relationships between human actors or agents (performers, composers, listeners), and on the other hand relationships between musical events themselves—within the ecological conditions of an ongoing performance of a piece of music. My methodology draws upon Gilles Deleuze's three syntheses of time as well as his reading of Spinoza’s affect: this pair of conceptual frames provides a potent point of departure for thinking serious about how time is embued in musical process, and how time and relationality are irreducible from one another. I also draw upon Jacques Rancière’s political theory, which challenges notions of determinate (or even determinable) identity (Rancière's police) in favor of one where identity is constantly and necessarily continously being invented from within the context of its emergence. Time and politics are shown here to be two intertwined aspects of the same concept. I will conclude with a brief example from the scherzo from Mahler’s ninth symphony, which puts this theoretical model into play from the perspective of the relationship between musical structure and performativity.

Distracted timekeeping  
Anthony Gritten (Royal Academy of Music)

Distractions are a ubiquitous presence in contemporary life, and an ability to deal with them is a key musical skill, as it is of life in general. That musical pedagogies often fail to reflect the wider world's obsession with distractions is unsurprising, and is borne out by the fact that, despite contributing massively to GDP, music is often ignored by policy makers. This is because musicologists have until fairly recently not provided much evidence that dealing with distractions is not just a transferable skill, but the most important one, an Ur-survival skill for the species. For every musician and every citizen is affected by distractions at some point. It is tempting to quip that "Nothing is certain but death, taxes and distraction".

Distractions, though, are only distracting within a social system in which their presence is ideologically configured as a matter of interfering with the steady ergonomic production of capital and the time keeping
required of certain kinds of tasks. The contemporary social system is, one might say, jealous of distractions, for its onward march depends on minimising distractions. Distractions are usually mentioned in the same breath as 'substandard performance', especially in managerial and technological contexts, and an inverse correlation is claimed to exist between 'task performance' and the level, persistence and intensity of distractions. Indeed, timing tasks that require explicitly reflective and intentional consciousness in the service of systemic productivity are often those in which the impact of distractions on the system is most noticeable, where the qualia are most intense and by-products such as social anxiety are at their highest. In these tasks, distractions are usually configured as an impediment to time keeping, and thus as a thorn in the side of consciousness. In such contexts the primary social response to distractions, spurred on by the apparent security offered by the dream of eradicating them, is to mitigate the risk of them occurring.

Reality, though, is complex, particularly in music making. While distractions often interfere with the timing of work (and there is a discipline devoted to its extinction called Interruption Science), and while distractions have a significant negative impact on cognition, timing, anxiety, memory, error rate, and fatigue, nevertheless distractions can be exploited under controlled conditions to aid work and enhance work-related tasks. As the successful evolution of homo sapiens suggests, distraction is actually helpful for maintaining an open responsiveness to changing circumstances - which is the real purpose of timed collaborative tasks (including music making). This is the job of the discipline of Ergonomics: to make the most of timed human-system interactions, and to tie input and output tightly together in the service of greater productivity.

This paper argues that this is also true of making music: that distraction can be a productive mode of engagement with noise, sound and music, and that distractions should not be perceived as threatening time keeping in musical activities, for ultimately all they do is ensure that the subject is "in contact with the music in its full particularity" - which is, after all, the telos of all listening regimes and all timing tasks in musical performance. Distractors are nature in operation, and it is through distractions that music receives its true species-transforming value: as a means of developing ways of working together and modes of entrainment that are properly pragmatic and in which timing is a means, not an end for the production of musical work. This paper is illustrated by examples from the music and performances of John Cage.
**Session A2**  
**Psychology I**  

### Timescales and temporal ranges: an enactive and dynamic approach to temporality in musicking  
**Juan Loaiza** (Queen's University Belfast)

An enactive and dynamical systems approach to music-making is an emerging area of inquiry that relies on notions of time and change firmly understood in non-stationary ways (e.g., Walton et al., 2015). The promise of such approaches is to overcome dominant views of cognition and behaviour as sequential, stationary progressions (Thompson, 2007:43; Di Paolo, 2015). For the study of music, this promise is also an opportunity to move beyond the empirical-versus-cultural divide (see Clarke et al., 2010:74), whereby the observed regularities proper to each side of the divide are assumed to happen as if they were in mutually non-intersecting timescales (e.g. the macro socio-historical versus the micro gesture-production timescales). For an enactive approach, the ongoing here-and-now is an historically rich co-definition of processes comprising brains, bodies and environment. In contrast to stationary “online/offline” and “bottom-up/top-down” conceptualizations, co-defining processes may be characterised dynamically by their relative ‘slowness’ or ‘fastness’, and manifest constraining and enabling relations in long ranges (see Van Orden et al., 2012).

The aim of this presentation is to propose a heuristic formulation of the complex multi-temporality of musicking. Temporality is often thought of in terms of “scalar hierarchies” (Salthe, 1991) whereby processes are partitioned according to their duration; thus, for example, a musical style corresponds to a timescale longer than a performance event that is longer than an execution of a note, and so on. This type of 'scalar hierarchy' is, however, of limited use. Instead, following the lead of dialogical systems theorists, what is proposed is a specification hierarchy of temporal ranges (Steffensen & Pedersen, 2014; Uryu et al., 2014). This tool allows to narrow timescales into relevant temporal ranges according to qualitative increments in complexity. Moreover, it offers a way to analysing the historical thickness theorized by enactivism as an alternative to cognitivism.

### Ensemble performance from a systems-theoretical perspective: opportunities and challenges  
**Marc Duby** (University of South Africa)

The organism-environment system is not a system consisting of the organism and the environment, which could be treated as subsystems, but the organism-environment system is rather a methodological principle. This methodological principle entails that, instead of looking at simple linear causal relations (e.g., the events from the stimulus to the response) when explaining behavior or subjective experience, the research should start from the determination of the results of behavior and lead to the necessary constituents of the living system determining the achievement of these results. (Järvilehto 2009, p.118)

In this paper I consider musical ensembles as open dynamic systems, capable of adapting to changing circumstances in real-time. Within a broadly eco-psychological framework (Gibson 1968; Gibson 2015; Clarke 2005; Windsor 2011; Windsor & de Bezenac 2012) and deploying models from systems theory, I examine the nature of embodied musical knowledge within environments within which these performances unfold over time: in short, as places where cognitive systems are both deployed and tested in the moment. Dynamic systems theory places the emphasis on how all manner of organisms adapt to changes over time, and therefore seems an appropriate (if comparatively under-documented) model for understanding musical processes.

Applying Järvilehto's methodological principle to activities within the specialised professional world of a particular class of human organisms (namely, musicians) provides, I will argue, a viable alternative theoretical framework for exploring concepts such as tacit knowledge, affordances, and distributed cognition as exemplars of the embodied aspects of knowledge made manifest through performance.

Systems theory as applied to this broad class of intentional activities recognises the transformation of musical material over time as a dynamic emergent process constrained by the specific rituals and stylistic conventions of the environment in question. I will argue that from duos to orchestras, ensembles provide rich and ecologically valid data for studying aspects of music cognition as a real-time emergent process. In conclusion, I suggest some appropriate techniques for collecting and interpreting the complex and fairly intractable data which emerge from such interactions.

### Rhythm in music: a comparative perspective
This talk explores broad comparative questions and approaches to the psychology of rhythm and timing in music. Building on previous efforts to describe music’s “design features” – those features that generically distinguish it from other forms of animal and human communication and behaviour (e.g. Bispham 2003, 2006, 2010) – and recent empirical studies on metre and entrainment, I will discuss what, if anything, can be seen as being unique to, or defining of the perception and/or production of rhythm in music. We know increasingly that engaging appropriately with even the most seemingly simple pulse involves a complex mosaic of psychological, physiological and social processes. We are also ever more aware that much (or perhaps all) of this complex mosaic is crucial in a whole range of communicative and behavioural repertoires where a pulse is putatively present but less overtly observable. The recently titled ‘speech to song illusion’ has, for example, been interpreted as evidence for a nebulous divide between ‘musical’ and ‘linguistic’ rhythm perception. I argue, however, that this reflects a relatively clear transition, due to increasing predictability, from one form of processing to another and that we can identify psychologically grounded specificities of musical rhythm. More precisely I propose that period correction mechanisms and a corresponding capacity to consciously attend to and be aware of a pulse-based attentional framework in music are crucial factors in of themselves and in enabling sustained group synchronisation and music’s other specific functions and efficacies.
Session B2
MetreRhythmTempo I

Tempo, drive and identity in Cape Breton traditional fiddle music
David Kirkland Garner (University of South Carolina)

Traditional Cape Breton fiddlers strive to achieve great “timing,” “lift” and “drive.” These are terms that are frequently used by performers and experienced listeners—terms that everyone knows, but rarely can define. In the liner notes to fiddler Glenn Graham’s album Drive, he writes that drive means “to push or propel onward with force…the provide the motive power for…to move along rapidly…a strong motivating power or stimulus...” In other words, Graham describes one way fiddlers create Epstein’s motion in music. I argue drive is a description of the expressive, global micro-accelerations that a majority of fiddlers perform throughout their sets. Most medleys speed up by just a few beats per minute over the course of the entire track, making it a subtle, gradual change that is felt more than heard.

Through analysis of jig medley recordings I propose answers to a number of questions about tempo in Cape Breton fiddling and more broadly about how traditional musicians perform tempo in our click-track-flooded contemporary musical landscape. Questions include: what is the specific tempo range for Cape Breton jigs? Is this range different from other fiddle traditions? Do individual Cape Breton fiddlers have a unique tempo range in which they perform, creating a sort of temporal fingerprint? How do jig tempos change depending on the setting (concert hall, dance hall, or recording studio)? I propose these answers through my analysis of starting and ending tempos in over 140 jig medleys by more than 25 different Cape Breton traditional fiddlers. I also present computer-aided, beat-by-beat analyses of 15 jig medleys, allowing for detailed comparison of fiddlers’ unique expression of tempo.

‘Just in Time’: Herbert von Karajan as an interpreter of Mozart’s Requiem
Karina Zybina (University Mozarteum, Salzburg)

Building on one of this conference’s mottos, that ‘time is the critical element in performance’, I aim to examine time relations and timing in Herbert von Karajan’s recordings. Karajan was, famously, an ardent enthusiast of the newly evolving recording technologies, and an early experimentalist in this field. The way those new possibilities inspired him might be traced in his recordings. My focus will be on his interpretations, both live and studio, of Wolfgang Amadeus Mozart’s Requiem K 626; more specifically — on one particular movement from this piece, Rex tremendae. By comparing and analyzing data retrieved from the ‘Sonic visualiser’ application, I will uncover Karajan’s different approaches to timing. While his ‘live’ recordings tend to be more flexible and ‘freer’ in terms of time relations between different sections of the piece, there seems to be a clear temporal ‘model’ that was followed in all Karajan’s ‘studio’ interpretations. The possibility to control time proportions and ‘temporality’ of the piece that was provided by these new technologies was therefore a crucial component of Karajan’s approach, and, indeed, an intentional and expressive means of his ‘studio’ work. This, in turn, will lead to other questions that will be addressed along the way — such as what this ideal temporal ‘model’ tells us in terms of Karajan’s view of this particular piece; how it relates to his understanding (and interpretation) of the poetic text; how this ‘perfect’ timing corresponds to Mozart’s original tempo indications. And, finally, in what way these new recording technologies shaped, on the one hand, Karajan’s individuality as a conductor, and, on the other, our own perception of Mozart’s Requiem.
The acoustical properties of a concert room tend to affect performers’ decisions, especially regarding tempo and agogics. Consequently, the study of the relationship between concert hall acoustics and the musical performance is of great interest to musical performers, and potentially to architects and acousticians as well. A pilot study was devised, enabled by a unique concert hall with mechanically variable acoustics. A concert pianist performed an identical program of two pieces at four trials throughout the same day in the presence of an audience of experienced musicians-researchers, each trial conducted under a distinctive acoustic condition. The trials were recorded for later analysis. The live performances as well as the recordings were assessed individually by the pianist himself and the members of the expert audience. The results showed clear as well as subtle differences between the different performances. The pilot study was followed by a two-year, still ongoing, research project, in which further experimental series of performances have taken place or are underway, using various chamber music constellations, as well as solo flute, organ and choir. In this project, the music performed has included 3–4 pieces from different periods and in different styles. The impression of the live performances from the performer’s own perspective, and also the professional listeners’, has often differed from the experience in listening to the recordings: what was felt during the performance as an ideal live acoustic was often not judged as optimal in the later analysis, especially in terms of agogics and tempo. The preliminary results raise fundamental questions about tempo treatment and artistic/interpretive decisions and promise to give new insights concerning what actually constitutes ‘good’ acoustics and optimal recording conditions from a musician’s professional perspective.
This keywords talk outlines a speculative but (I hope) mostly unsentimental framework in which temporality, musicality, and sociality are treated as intertwined, mutually constitutive, and perhaps even indistinguishable, since all three capacities emerge from our originary experiences of embodiment, movement, and intersubjectivity.

Time is usually described as a quality, substance, or parameter that we deem essential to whatever we mean by "music" or "the social"; but we might instead regard time as a collection of by-products of the workings of these two latter categories. Starting from J.J. Gibson's proposition (1975) that "events are perceivable, but time is not," and obviously stealing more than a few pages from Latour (2005), we might retheorize "time" as a conceptual assemblage, grounded in the cycles, locomotions, events, actions, and spans that our species "does." It is known that we can categorize aspects of what we call music in terms of "what a body can do" (Iyer 2002; Tomlinson 2015) — breathe, walk, talk, and so on — to highlight how our musicality is comprised primarily of actions of our bodies (including our embodied minds). Similarly, we can treat "the temporal" as an emergent set of properties of our periodicities and tempi – the pulses, waves, surges, and incremental shifts inherent to us – not only on the scale of the individual, but also in the context of family, community, society, and larger relational aggregates.

In so doing, we strive to account for structurally disparate temporalities (as Bourdieu (1977) allows that a hierarchical society will include multiple habituses corresponding to social class). If by structure we mean the networks of power that coalesce and fragment across turbulent histories, then the accompanying variations on agency -- confrontations with stasis, opportunities for movement and change -- will necessarily produce profoundly divergent experiences of the temporal (e.g., Nyong'o 2012, Wilderson 2016).

Gibson, J.J., 1975. "Events are Perceivable but Time is Not." In Fraser, J.T. et al. (eds.), The Study of Time II (New York: Springer-Verlag, 1975), 295-301.
### Session A3
#### MetreRhythmTempo II

**Timing and emotional transformation in Arab music as manifested in a Sufi ritual dhikr, and the wasla, a secular musical suite**

Guilnard Moufarrej (United States Naval Academy)

Western musicologists, theorists, and critics, who have come into contact with Arab music and culture since the late eighteenth century have noted the power of Arab music to evoke emotions. They have observed ecstatic behavior and states of rapture during musical events. Ethnomusicologist Gilbert Rouget, in cross-cultural work on the relationship between music and trance, has stressed that of all peoples, Arabs make the strongest association between music and trance and that this association applies to both sacred and secular practices.

My paper addresses the relationship between timing and emotional transformation in Arab music, a concept called tarab, which has no exact equivalent in Western languages. In Arab music, the temporal organization of time is governed by rhythmic modes, which underlie the melody and are rendered on percussion instruments. Regularly recurring patterns generate an orderly temporal flow, which adds an ecstatic dimension to performances. At the same time, changes in the length and tempo of the patterns can evoke a stately presence or intensify an ecstatic state, carrying it to an emotional climax. I shall examine these patterns in two contexts: dhikr, or “remembrance of God,” a sacred ritual practiced by many Sufis orders, which involves devotional repetition of standardized names of God in a rhythmic manner leading to trance; and the wasla, a secular musical genre, which consists of a medley of traditional genres and incorporates compositions built on various patterns of beats.

My paper draws from the work of al-Khula’i and A.J. Racy, who have noted the role of meters in evoking a tarab effect. I argue that whereas discourse on the relation between Arab music and ecstatic feeling have focused more on the melodic modes, the song lyrics, and the vocalist, timing, as Epstein contends, is the “critical element in performance.”

### Metric displacement and group interaction in “Evidence” by the Thelonious Monk Quartet

Ryan Bruce (University of Guelph)

Jazz pianist Thelonious Monk is known for his rhythmically complex compositions and improvisations. His typical thirty-two-bar AABA form pieces provide a framework of musical norms in terms of harmonic movement, and thus a point of reference for the harmonic rhythm to be displaced. “Evidence” is exemplary of Monk’s displaced rhythms, which creates a sense of metric shifts during the head arrangement. Composed ca. 1948 and being a frequent piece of Monk’s performance repertoire throughout the 1960s, a transcription and analysis of the recording from Live At The Blackhawk demonstrates how musical “mistakes” produce a conflicting sense of metre between band members. This paper investigates how the musicians negotiate metric discrepancies in the composed section and the saxophone solo in terms of group interaction.

The analysis takes note of writings by jazz critics (Whitney Balliett, André Hodeir, Martin Williams), analyses of rhythmic displacement of Monk’s music (David Feurzeig, Mark Haywood, Mark Tucker), and builds upon their findings with contemporary works on Monk (Robin Kelley, Gabriel Solis) and research on interaction in jazz (Paul Berliner, Ingrid Monson). The analysis illustrates musical signals by the rhythm section and the soloist with reference to: 1) the rhythm of the melody and comping provided by the piano, 2) harmonic rhythm and groove according to traditional norms in jazz practice, and 3) a formulaic analysis of the saxophone solo that indicates harmonic rhythm and metrical placement of the beat.

In a product that was a musical success, the musicians arbitrated a decisive point of reference within a confounding performance of overturning the beat. However, the analysis shows that Monk knew exactly where the downbeat should land during periods of metric turmoil. In conjunction with the analysis, this paper emphasizes how the musical process of jazz praxis is temporally negotiated during the course of performance.
Cultural and individual particularity on the canvas of the metrical hierarchy
John Paul Ito (Carnegie Mellon University)

The proposed paper offers two large-scale ideas relevant to several conference themes, including how universal cognitive tendencies relate to unique cultural practices, how individuality and difference relate to a potentially totalizing entrainment, and the role of performance.

First, the recursive symmetry of the metrical hierarchy could potentially negate difference, stripping individuality from beat levels, listeners and performers, and musical cultures; but cognitive and physical behaviors have attached to specific beat levels, giving them particular meanings and associations with practice. My forthcoming book argues that performers choose a beat level for a special kind of physical investment that organizes motion and affects expressive shaping. The same music, understood with the same metrical grid, feels and sounds different when felt in two versus in four. And in a 2013 article on hypermeter, I claimed that listeners orient themselves in time based on overlearned templates that unite tactus beats into heard measures and heard downbeats into heard hypermeasures. This enables much richer hearings (“beat three of hyperbeat two”) than are possible with the grid alone.

Second, consistently patterned cultural practice does not suppress rich differentiation but rather establishes it, because complex and imaginative variations and extensions require well-entrenched norms. In the 2013 article, simple schemas enabled complex phrase rhythms to be heard in terms of scrambled hyperbeats. Here, passages from Brahms carry this flexibility down to the heard meter; renotated barlines cannot describe our hearings because new metrical orientations begin with weak beats. And, also drawing in performers’ felt beats, Brahms sets up moments that suddenly and deliberately thwart listeners’ ability to entrain to the performers; listeners can no longer join in the unfolding of the music and instead experience disjunction and awareness of otherness.
Session B3
Temporality and History I

Temporality and History I
Ellen Davies (University of Oxford)

Paris, 1913. Stravinsky’s *Le Sacre du Printemps* premieres, and contemporary critics lament the ‘mechanical rhythm’ and ‘imposed fragmentation’ (Jean Marnold, *Le Mercure de France*, 1 October 1913). Debussy’s *Jeux*, largely forgotten in the chaos of *Le Sacre* a few weeks later, receives critical contempt for ‘the vagueness of line in unclear music’, with audiences arguing that ‘it was not possible to distinguish between a rhythm or one of its developments’, or the corresponding ‘mechanical gestures’ of the dancers. (Victor Debay, *Le Courrier Musical*, 15 June 1913). The comments are suggestive of the non-linear musical temporality of these compositions. However, instead of being isolated incidents of temporal innovation, might these works be part of a broader ‘culture of time’? My doctoral research focuses on understanding these musical innovations and modernisms in pre-WWI France in the context of contemporary preoccupations with time and the breakdown of linear temporality.

This paper is concerned with the interactions between musical activity and cultural and technological change in the fin-de-siècle, and how this shaped concepts of temporality. I examine the way in which old and new media formed fascinations with time in the Parisian subconscious, taking Foucault’s concept of episteme to explore time as a basis for systems of knowledge underpinning Parisian culture.

In this paper I will consider the role of silent film and the dialogue this created with concepts of time in Parisian culture. My paper will look in detail at particular early cinema examples, notably *Fantômas* (1913), and examining the role of nostalgia, cinematic memory, and the distortion and multiplicities of pastness and present. I will then consider how we might use cinematic concepts of time for an understanding of musical temporality: specifically, for analysis and categorisation of temporal non-linearity. How can we create a dialogue between early cinematic technologies, Parisian cultural understandings of time, and innovations in musical non-linearity?

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**A Bergsonian unfolding of time: the paired love duets in Puccini’s *La Fanciulla Del West***

Kae Fujisawa (The Graduate Center, City University of New York)

Toward the end of the nineteenth century, the new pan-European standard time (an embodiment of Kantian universal time) and the prevailing politics of “respectability” regulated people’s lives within a rigid socio-cultural order. The inevitable reaction was a desire to recover more natural human dispositions, such as intuitive experience of time, free will, and free love. Henri Bergson’s “real time” or *durée*, a continuous, heterogeneous, free unfolding of feelings (1889), and its extension to the creative endurance of *élan vital* (1907) struck a chord with this fin-de-siècle reappraisal of social structures. Puccini’s *La fanciulla del West* (1910) emerged post-*élan vital*. Existing scholarship disagrees about the structures of the two love duets for Minnie and Johnson (one each in Acts I and II) because it fails to consider how the fin-de-siècle controversy and Bergson’s concepts of time are embodied in the music.

In this paper, I examine the text and music of these duets in relation to the characteristics of *durée* and *élan vital*. The duets are a dramatic pair, representing a single falling-in-love process through which Johnson’s yearning for redemption and Minnie’s desire to fully embrace him progresses towards fulfillment. Puccini’s musical realization of this process eludes the conventional tonality-based analytical approach. However, the divergent and yet integrated unfolding of musical elements (meter, tempo, key, and thematic materials) in the duets provide a unique overarching narrative coherence and continuity on both the local and macro levels. The resulting drama of yearnings mirrors the Bergsonian ideals of freedom that permeated contemporary society, even as Minnie’s unshakable will to action and uncompromised virginity navigate the fine line between freedom and respectability required for the fin-de-siècle opera stage. By approaching the duets with Bergson’s conceptions of time in mind, this reading provides a full accounting of Puccini’s artistic creation of emotional-temporal realism.
However firm its status as a nineteenth-century classic, Brahms’s *German Requiem* continues to defy analysis and categorisation. Although based on historical models of German funerary genres, the *German Requiem*'s position among nineteenth-century genres is not easily defined. The work occupies a peculiar middle ground between oratorio and requiem, and in consequence between a musical work that is designed for aesthetic and intellectual contemplation on the one hand, and active prayer on the other. Its widespread reputation of “comfort for the living rather than prayer for the souls” notwithstanding, the work has retained significant traces of the requiem’s liturgical and communal functions.

A reconsideration of the *German Requiem* according to the perspective of the politics of time may offer a new way to deal with its idiosyncrasies. Daniel Beller-McKenna’s reading of the *German Requiem*'s temporal structures as ideological endorsement of the German nationalist cause demonstrates the close connection between the construction of musical time and actual political expectations and strategies. His ideological interpretation, however, is not the only way to understand the work’s temporal structures. The *German Requiem*'s peculiarity lies in its inspired combination of three modes of temporal experience: cyclical time, linear time and communality. The three modes are both present in the selected Scriptural texts and in the musical structures. The sense of cyclical time is conveyed through the work’s many structural parallelisms and topical references to the pastoral. Linear time is conveyed in the goal oriented cadential structures that underline the eschatological moment. Communality, defined as the sense of being together in a sustained sharing of a specific emotion, is specifically represented in the manipulation of *stile antico* codes.

This paper aims to analyse how the different modes of temporal experience relate to each other in the *German Requiem*, in order to relate the work more closely to historical conceptions of time.
Day 2: Tuesday 13 September

Session A4
Interpersonal II
Consort music performance and synchronization
Alon Schab (University of Haifa)

What mental procedures were required of renaissance madrigal performers in order to make sure that they and their fellow singers are in time together? The ever-growing interest in early music allows performers and researchers nowadays to question modern practices, experiment with older modes of performance, and gain fresh perspective on the interaction between performers.

In my paper I will examine those skills pertaining to synchronization that are required from performers of polyphonic consort music (and specifically English madrigals and viols consorts 1550–1650) when reading from partbooks without barlines and without having a full score visible to them. Compared to choir singers nowadays, who read their part from a vocal score while visually following others’ parts, consort performers reading from original parts have to rely on very different procedures that are almost exclusively aural: their counting cannot rely on regular division into bars; they constantly have to make sure that what they hear conforms to what they perceive as the style of the music they perform; they are therefore required to absorb basic theoretical concepts like dissonance and consonance and be alert to their occurrence; they must develop high "recovery" skills in case they find out they are no longer in time with the rest; and they often establish a list of check points where they expect to hear specific cues in other parts.

In my talk I will present a model for analysis of the temporal interaction between consort members. I will show that the study of this mode of performance, so fundamental to the way in which past musicians worked, may allow us better to understand the art of consort music and to understand certain mechanisms of ensemble performance which are, indeed, timeless.

Musical connectivity and micro-timing in sitar and tabla performance
Alec Cooper (University of Edinburgh)

This presentation explores the link between sitar and tabla performers’ micro-temporal interactions and their varied experiences of musical connectivity, a term I use here to encompass a wide range of positive social feelings which may emerge in the course of ensemble performance, including cohesion, rapport, shared enjoyment, and, potentially, a merging sense of self and other.

I argue that while we have come a long way in understanding the general mechanisms by which people ‘connect’ through music, we may learn more about this topic by investigating its variability in ensemble performance. For example, why is it that some performers seem to connect more than others, or that the same two performers may report feeling highly connected one day and disconnected the next? More importantly, are such differences in social experience entirely personal and circumstantial, or are they tied to consistent patterns in musical behaviour?

There are several reasons why micro-timing might play an important role in performers’ experiences of musical connectivity. For instance, micro-temporal fluctuations are considered essential in shaping stylistic and expressive musical features, and - some argue - in generating pleasurable bodily responses to music (i.e. groove).

I shall report findings from original research based on a collaborative, ethnographic case study consisting of nine live performances and performer interviews, in which I extracted acoustic onset timing data in order to explore the relationship between performers’ micro-temporal interactions and their self-reported experiences of musical connectivity. Results indicate that both proficiency and connectivity correlate with higher asynchrony values. Based on these research findings, I offer a hypothesis as to why and how might the most highly connected and/or proficient performers’ onsets be the least synchronized, and discuss the value of this research for our general understanding of micro-timing and musical connectivity.

The devil is in the detail – rich representations of a partner’s contribution facilitate temporal coordination in joint music performances
Previous research suggests that humans engaging in joint actions, such as playing music together, do not exclusively focus on their own contributions to the joint action. Rather, they represent the whole joint action outcome, including others’ contributions to it (Loehr et al. 2013). In addition to being useful for monitoring and predicting the success of a joint action (Vesper et al. 2010), more detailed representations of another’s contribution to a joint action may help to achieve the high temporal coordination necessary for joint music performances.

To test whether representing details of another’s performance can enhance temporal synchronization, we invited pairs of participants, one piano expert and one piano novice, to play simple piano duets where expert and novice used only one hand each. We manipulated two factors that may lead to a more or less detailed representation in the expert of the novice’s contribution to the joint action. First, we manipulated whether before playing a duet with the novice, the expert knew either both her own and the novice’s score, or just her own part of the score. Second, we manipulated whether before playing a duet with the novice, the expert could hear the novice practicing her part or not. Both factors were manipulated as within-subject factors.

The results showed that asynchronies in duet performance were significantly reduced when the expert had witnessed the novice’s practicing and when the expert knew the novice’s score. Witnessing the novice’s practice facilitated coordination particularly for passages that were relatively easy for the novice. Knowing the novice’s score particularly helped with more difficult passages that required the novice to change the hand position on the keyboard. The results demonstrate that perception as well as knowledge can enhance representations of joint actions in experts that lead to better temporal coordination in musical joint action.
Session B4
Temporality and History II

Spectra of Marx: the temporality of revolution in the music of Gérard Grisey
Naomi Woo (University of Cambridge)

The music of so-called spectral composers Gérard Grisey, Hugues Dufourt and Tristan Murail—among others—is conventionally thought to be based on creating new sounds by means of the harmonic spectrum. Specifically, these composers are known for making sounds and timbres (rather than, for example, pitches or scores) the forefront of their music. It was Gérard Grisey who uttered the famous injection, oft-repeated as a motto for the movement, that ‘we are musicians and our model is sound not literature, sound not mathematics, sound not theatre, visual arts, quantum physics, geology, astrology, or acupuncture.’ Unsurprisingly, then, timbre and sound have been the subject of most analytical and historical studies of spectral music.

This paper suggests that greater attention is owed to the temporality of these works, and more specifically, the ways in which the concept of time overlaps with the political context of the spectral moment. While there has been some research suggesting that the spectralists were inspired by the outbreak of revolution in May 1968, all of these studies have focused on timbral rather than temporal concerns. This paper uses Heidegger’s *On the Origin of the Work of Art* as a framework for understanding the politics of these musical works, focusing on his idea of a ‘temporality of revolution’. Using concrete musical examples from Gérard Grisey, along with his extensive writing about time (in essays such as *Tempus ex Machina: a composer’s reflections on musical time*), the paper shows how this music enacts the revolutionary temporality of 1970s post-industrial France. This study not only sheds light on an under-examined aspect of spectral music, it also suggests ways we might think of the politics of musical time more broadly.

Musical time in a fast world: New York, 1983
Samuel Wilson (Guildhall School of Music and Drama / London Contemporary Dance School)

Immanent to the ‘cultural logic of late capitalism’ (Jameson 1991) is a temporal logic. The sonic arts (music, sound art, etc.) variously withdraw from and/or embrace time as it is disciplined normatively, and may thereby critically call into question our assumptions about lived temporality.

In this paper, I engage two works, both of which are intimately connected with the city of New York and the year 1983: Morton Feldman’s minimal yet durational String Quartet No. 2, and Bill Fontana’s *Oscillating Steel Grids Along the Brooklyn Bridge*, the latter of which involved sounds from this bridge (traffic, the metal strut work, etc.) relayed live and broadcast in downtown Manhattan as part of an installation.

Both works criss-crossed different temporalities and lived rhythms that contrasted with the speed implicit in 1980s hypercapitalism. Indeed, as Ben Highmore (2005) has pointed out, assumptions about the speed and acceleration of modern urban life tend to obscure the temporal contradictions involved in actually living it, as well as artistic reactions against normative assumptions about time as lived. Feldman’s quartet withdrew the listener from regulated time and repetition, and focused instead on duration and the impossibility of repetition. Fontana’s *Brooklyn Bridge* sonically re-presented the movements of commuters and commodities, and the physicality of these daily rhythms (Lefebvre 2004). It was also a work realised in honour of the Bridge’s centenary and thus engaged ideas of historical time that complicate more immediate temporal concerns. Both artworks explored manifold contradictions of musical time and its place in a ‘fast’ world. Furthermore, these late modern temporalities disturbed the dominant teleological, linear temporalities that Karol Berger (2005, 2008) has suggested were constitutive of an earlier stage of musical modernity.
The title of John Cage’s *Organ2/ASLSP* (1987), which bears its specific tempo marking, elicits performances that vary dramatically in their total duration. Because the organ, the instrument Stravinsky called “the monster that never breathes,” is capable of sustaining tones indefinitely (assuming a constant wind supply), the interpreter must consider the meaning and ultimately the performance logistics regarding Cage’s provocative “as slow as possible” instruction. Consequently, tempo and duration become the most critical elements of the work. Cage notates the rhythms proportionally: thus, the premiere performance of 29 minutes, my own performances of 11 and 15 hours, and the performance currently in progress in Halberstadt, Germany, begun in 2001 and scheduled to last 639 years, all present the rhythms identically, albeit on different time scales.

This paper will discuss issues regarding the temporal realm of *Organ2/ASLSP*, specifically score notation, historical context, performance preparation, counting or timekeeping options during performance, nonmusical considerations and practicalities affected by tempo, and the curious practice that the desired total time of a performance ultimately determines its actual tempo instead of a chosen tempo determining its total length. Special attention will be given to the *John Cage Project-Halberstadt*. While this 639-year realization might be considered extreme in its adherence to Cage’s tempo instruction, the implications of this noteworthy performance challenge existing notions of tempo, keeping time, rhythm, musical essence, and most significantly, performer and audience.

Finally, the paper will address listeners, who are confronted with experiencing nonprogressive sounds presented along an extremely slow timeline. Conventional musical expectations—along with the sense of past, present, and future—are inevitably obliterated when listeners encounter such exceptionally long and unpredictable sonorities. Submitting to each individual sound in the moment, one discovers that even a single, sustaining sonority generates an entire microcosm of rhythmic activity.
Session A5
MetreRhythmTempo III

Northern additivities? Questions of conceptualization and typologization of structures of performed musical time and tonality – exemplified by data-oriented research of North Scandinavian and West Siberian indigenous musical traditions

Jarkko Niemi (University of Tampere) and Marko Jouste (University of Oulu)

In our presentation, we would like to approach particularly the problems of performed musical time and tonality, exemplified with cases of northern indigenous song traditions of North Scandinavia and West Siberia (the Sami and the Nenets). Our framework stems from ethnomusicology, and it has a multidisciplinary character in the sense that our past and present research is theoretically and methodologically also connected with perspectives of ethnography, linguistic anthropology, history and musicology.

We approach our problematic of conceptualization and typologization of some structural elements in our research examples in this presentation from the standpoint of musical text (cf. Ruwet 1967; Nattiez 1990). Notwithstanding the large-scale shifts in cultural studies away from various unproblematized, asymmetrical or reifying research questions, and towards, for example, issues of power, discourses, representations and identities – characterized in ‘reflexive turns’ in both anthropology (Clifford (ed.) 1986) and in musicology (Cook & Everist 2010 [2001]) during the last decades of the 20th century, we believe that considerations about musical text still have some relevant functions in the totality of an (ethno)musicological research.

In particular, we would like to propose rethinking for some of the concepts of the mid-20th century musicology, such as divisivity vs. additivity as musical structures (Sachs, Brăiloiu, Hood). We would also like to propose some new concepts designed for analytical understanding about the autonomical, resilient and relational character of musical structures in traditional performance.

An important corollary for this presentation is the meaning of the availability of the research data. Many of the northern indigenous musical traditions face substantial threats of cultural continuity, some are completely forgotten, some are transformed along with the processes of modernisation. A concrete example of this is the availability of recordings of musical performances in archives of various institutional levels. For example, the organisation and institutionalisation of recorded cultural data of the various Scandinavian Sami local cultures has produced a continuum of stories of their use – ranging from asymmetrical exploitation to locally initiated revitalisation.

‘For signs and for seasons and for days and years’: hierarchies of musical and textual rhythm in Steve Reich’s Tehillim

Martha Sullivan (Rutgers University)

Steve Reich’s Tehillim poses challenges to critical analysis and to performance—the music drives forward but without periodicity, making its rhythmic procedures hard to grasp and difficult to learn. Locally asymmetrical meters eliminate Krebs’ metric displacement analyses as a tool; Hasty’s “qualitative” approach clarifies how beat moves to beat within a measure, but does not account for larger structures; Horlacher’s ideas of accentual identity and metrical dissolution are helpful, but do not engage the poetry’s own strategies. Exploring the psalm text of Tehillim’s first movement reveals versification processes operating on local, middleground, and large-scale levels. Reich describes the Hebrew text as the source of his melody, accounting for local asymmetrical meters. However, this locally destabilized rhythmic activity is also mirrored on a larger scale in the shapes of musical phrases (middleground activity) and an overall structural level (the movement’s ABA’ form). The hierarchical structures of the text and the music interact more closely, on more levels, than Reich admits.

In this paper, I uncover parallel hierarchies of text and music through a close analysis of the text, down to the level of individual Hebrew letters, as phonemes and lexemes generate melodic shapes in the music. On a larger scale, I demonstrate how Reich’s use of canons and harmonic stasis manipulates performers’ and listeners’ perception of time by asserting patterns, then dissolving them within the overall ABA’ form. I show how Reich’s music responds to biblical texts about time, and the celestial objects that mark it. I add to Reich scholarship by privileging textual analysis as highly as musical analysis, and showing how the hierarchies in the Biblical poetry drive the hierarchies in Reich’s music. My own personal narrative of Tehillim performance confirms my music-theoretical analysis. All of this may clarify the music for scholars and performers alike.

The ideality of time in music
Roger Redgate (Goldsmith’s College, University of London)

What does it mean to speak of rhythm in music? Generally, as musicians in the Western classical tradition, we often understand the temporal aspects of music in relation to notation, divisions of space into time units assigned to specific tempi. We also accept that there is a necessary element of latitude in performance, and that some musical parameters are more relative than others in terms of perception and execution. We consider time to be one of the more accurate, since we are able to play together with a reasonable degree of consensus. However, to what degree are aspects of musical time conditioned by notation? Recent developments have lead to certain rhythmic complexities, unthinkable without the intervention of notation, which many performers consider unplayable. So what might be the meaningful limits of such latitude in performance in relation to time and rhythm? Similarly some aspects of musical rhythm and gesture might be considered un-notatable.

Given the complexity of human beings, human relations and the structure of communication through both written and spoken language, it is perhaps striking that many discussions concerning the temporal aspects of music focus more on comparatively simple, clearly defined structures, music that is immediately repeatable, than more complex temporal relationships. This would seem a surprisingly narrow approach to the potential complexities of temporality in music, which significantly restricts our apperception of certain aspects of rhythmic flux and temporal flow.

This paper will examine the above in relation to composition/performance of complex rhythmic structures and the psychology of notation and its relation to language.
The effect of backbeat on metrical hierarchy and tempo perception in rock music
Bryn Hughes (University of Lethbridge)

Theories of classical music suggest that we perceive meter by regularly grouping pulses to form a metrical hierarchy in which emphasized pulses become beats, emphasized beats become measure boundaries, and so on (Lerdahl and Jackendoff 1983). These theories focus primarily on the music of the Common Practice, and ignore genre-specific traits that might influence meter perception. Listeners are keenly aware of stylistic traits that define musical genres (Gjerdingen and Perrot 2008). Genre has been shown to impact listeners' expectations of harmony (Hughes 2011), tempo and meter (McKinney and Moelants 2006).

Tactus is considered by many to correspond with listeners' perception of tempo (Drake et al 2000). Nevertheless, equating tactus rate to tempo may ignore other musical parameters that impact our sense of “musical speed” (Epstein 1995). Rhythmic patterns with equivalent event density may differ in metrical organization, which can interfere with tactus-based judgments of tempo and speed (London 2009). If genre-specific musical traits impact metrical hierarchy, they may also influence tempo perception.

The present study proposes that theories of tempo and meter perception in rock music should consider the location of the backbeat, a stylistic trait of vital importance to rock musicians' metrical orientation (Attas 2015). Through the analysis of numerous songs from the repertoire, this study shows that backbeat influences our perception of measure boundaries. This challenges traditional models of metrical hierarchy and tempo judgments determined by tactus rate. Excerpts with identical BPM measurements that differ in backbeat placement convey vastly different senses of “musical speed.” Backbeat placement provides an important caveat to rock's metrical hierarchy, and could also have substantial implications for the design of music preference algorithms that depend heavily on BPM measurements.

Towards a cognitively-based quantification of metrical dissonance
Mark Gotham (University of Cambridge)

'Metric dissonances occur when secondary accents ... undermine the established metre to the point that a secondary metric framework may emerge' (London 2016). The scholarship has tended to focus on metric dissonance in classical music (Krebs 1999), but is now beginning to diversify (Biamonte 2014).

One of metrical dissonance's main functions is to create and manipulate tension. The level of tension can be more or less acute depending (in part) on the type of dissonance used; moving among these dissonances can contribute to the shaping of a musical argument. This paper seeks to develop a model for that gradation of relative dissonance using a quantification based on experimentally-substantiated principles of cognitive science.

We begin with a basic model of metre where a metrical position's weight is given simply by the number of pulse levels coinciding there (Lerdahl and Jackendoff 1983). This alone enables a categorisation of displacement dissonances for simple metres, and a first sense of the relative differences between them. These arbitrary weighting ‘values’ are then refined on the basis of pulse salience research (Parncutt 1994, van Noorden and Moelants 1999, Gotham 2015) to suggest more subtle results.

Like most temporal devices, metrical dissonance is highly dependant on tempo, with each type becoming more dissonant for faster tempos. Similarly, greater dissonance is achieved by changes which involve the faster pulse levels, and even the difference between dissonance types appears to be greatest between those at the fast end.

Finally, the model is applied in analysis and a first extension to include 'mixed' metres is proposed. This sheds light on known problems such as the relative stability of mixed metres in different rotations (London 2012) and suggests a new result concerning mixed metres' relative susceptibility to metrical dissonance.
How can a performer shape experience of time for an audience?
Michelle Phillips (University of Cambridge/ Royal Northern College of Music)

Empirical studies have suggested that, when listening to music, experience of time may be altered by a person’s age and level of musical training (Phillips & Cross, 2011), by their subjective ratings of enjoyment (Areni & Grantham, 2009; Phillips & Cross, 2011), familiarity (Bailey & Areni, 2006) and finishedness (Phillips & Cross (in preparation), and by the music’s characteristics, including modality (Kellaris & Kent, 1992; Ziv & Omer, 2010), tempo (Noseworthy & Finlay, 2009), harmonic variation (Firmino, Bueno & Bigand, 2009), and volume (Kellaris & Altsech, 1992; Kellaris, Powell Mantel, & Altsech, 1996). Two recent experiments also provide evidence that estimate of elapsed duration may be altered by the amount of separate ‘events’ perceived to have occurred in an extract of music, and whether working memory is occupied during the listening period (Phillips & Cross, in preparation). Models of psychological time divide experience of duration into two categories: prospective experience occurs when a person is aware of time passing (such as in a waiting room, or on hold on the telephone), and retrospective perception takes place when a person judges a period of time after the event is complete. These are addressed in the most recent literature using internal clock and contextual change models respectively. Discussion of cognitive processes involved has mainly centred on attention and memory, but few studies examine the link with timing and entrainment literature. This paper will examine how timing literature, focussing on dynamic attending theory and the metric binding hypothesis (Jones & Boltz, 1989), could be combined with findings of empirical research, to offer a proposal for a new theoretical model of psychological time as it features in music listening. Potential mechanisms for empirical testing of the model will be proposed, along with implications for performers.
Music has been described as an art of time (Alperson, 1980; Wiora, 1957) and as experienced by listeners as structured and shaped time (Epstein, 1995). These descriptions highlight a fundamental commonality of time and music, which is their irreversibility and volatility. However, it appears that, during the course of listening to a particular piece of music a temporal gestalt needs to be brought along by the listener (actively), meaning that time may not simply be a scientific auxiliary variable. Rather, time may also be considered a gestalt dimension of auditory perception in which auditory events relate to each other, so that their wholes create forms. A typical manifestation of this kind of temporal form or gestalt can be found in rhythm, being „a preferential mode of uniting perception and action, the source of social manifestations and the basis of arts of succession and movement.“ (Fraisse, 1975, 232)

In his seminal work on the structure of rhythmic gestalts („Über den Aufbau rhythmischer Gestalten“) Erich M. Schmidt (1939) sought to investigate the peculiarity of this issue using empirical methods. Schmidt asked participants to reproduce certain rhythm patterns and then proceeded to investigate aspects of rhythmic figuration by analysing the proportions of the mean beat intensity (finger tapping force).

The potential of this approach will be discussed. The goal is to develop an experimental design that is suitable for the examination of musical figuration of rhythm patterns produced by expert/professional musicians and percussionists.

A growing body of cognition research continues to affirm the central role of Time in the perception and performance of expressive meaning in music. In particular, the shaping of fluctuations in the temporal flow of a work largely define both listeners’ experiences and performers’ own "action identities" (Repp and Knoblich 2004). However, since the perception and execution of temporal fluctuations is highly contingent upon the melodic and harmonic context of a musical passage, I argue that such expressive timing must be understood as a function of both time and musical space, an "energetic shaping through time," to quote Robert Hatten’s definition of Gesture (Hatten 2004) — that is, expressive timing is inseparable from gesture. Furthermore, research points to Inertia as the central carrier of meaning in physical gesture, conveying sensations of effort, force, and agency in dynamic gestural topologies. Consequently, I contend that the temporal fluctuations of expressive timing are merely surface manifestations of a richer metaphorical Inertial discourse. In short, Inertia, rather than Time, is the critical element in performance.

This paper presents an empirically grounded, theoretical examination of the central role of Inertia in both the execution and perception of expressive timing: specifically, Inertia as a qualia of musical and physical gesture. Utilizing a Gibsonian Ecological model of gesture grounded in the common coding of perception and action, I propose that performers and listeners engage in the Inertial discourse of performance through Direct Perception and Direct Action at the level of gesture, constructing and entraining cultures of time and collaborative cohesion through what I call "Ecologies of Practice." From this vantage point, any discussion of making, shaping, and keeping Time is a discussion of music as a fundamentally kinesthetic activity, mappings of our embodied gestural ecologies through the metaphor of Inertia.
Granted that we in musical experiences may have a range of feature durations from the very short, say in the area of a few hundred milliseconds, to that of several hours, the focus here is on the very short range, on what we may subjectively perceive as the musical instant. This is based on the conviction that very many salient features may be found at this timescale, both in the perception and in the production of musical sound.

We have had theories suggesting the importance of short fragments in musical experience, from Husserl’s idea of perception by a series of ‘now-points’ to Schaeffer’s theories of sonic objects, as well as systematic psychoacoustic studies of duration thresholds in sound perception and recent studies of duration thresholds for salient musical features by Gjerdingen and Perrot, by Krumhansl, and by Plazak and Huron.

In parallel, research in human motor control has suggested that human motion is goal-directed and proceeds by what could be called key-postures at intermittent points of orientation, and in our context, such as at downbeats and other accents, surrounded by continuous motion, e.g. of the mallet/hand accelerating from the starting position to the impact with the drum membrane, bouncing up and back again to equilibrium. We believe there is a very close relationship between sound-producing motion and perception, and that salient experiences of the musical instant are linked with the biomechanical and motor control constraints involved in music. In particular, we think that the motion acceleration peaks and ensuing impacts in performance are typical of salient moments in music.

Understanding the musical instant as closely linked with the various physical and cognitive constraints of sound-producing motion could be useful for several domains of music-related research, e.g. such as in understanding chunking, beat extraction and entrainment in musical experience.
### Session B6
**Temporality and History III**

#### Maelzel’s metronomic progeny
Alexander Bonus (Bard College)

Johann Nepomuk Maelzel, a figure most recognized today for “inventing” the clockwork metronome, was one of the most famous automata-showman of the nineteenth century. During his lifetime many who knew his name considered the metronome to be his least spectacular, least important device. This paper offers a reception history of Maelzel, the metronome, and his automata, in which the cultural significance underlying his many clockwork creations is explored across the long nineteenth century. As documented through numerous accounts, Maelzel's automata performed activities once-reserved for humans alone, yet they moved and sounded in time with altogether un-lifelike qualities—with decidedly inhuman performance practices. Maelzel’s machines therefore figured prominently in discourses about artificiality, volition and expression, alongside the living qualities of musical temporality. His machines emblemized a culture that ran in direct opposition to the subjective “artistry” practiced and endorsed by many skilled performers and composers over the century.

This study thusly addresses a discord in the values underlying musical time and performance practices for both Maelzel’s age and ours: the mechanical consistency, redundancy, and relative precision witnessed in Maelzel's machines—technological qualities largely rejected by Maelzel’s musical contemporaries—are often vehemently endorsed today by many professional musicians and educators who strive for exactitude in rhythm, correctness in tempo, and precision in replicating composers’ intentions, even for music that predated Maelzel’s metronome. Ultimately, this prevalent “metronomic mentality” is questioned as an anachronistic technoscientific orthodoxy that neglects prominent musical-temporal aesthetics from a pre-Industrial and pre-metronomic past.

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#### 10, 11, 12 and 13½ bar blues: reflections on African-American country blues recordings (1925-38)
Andrew Bowsher (University of Oxford)

This paper analyses commercial recordings of African-American blues in the early twentieth century. I examine the politics of representation involved with these historical recordings, where subsequent generations of often non-African-American blues practitioners have smoothed out rhythmic and structural irregularities in the original performances, and have been highly selective over the verisimilitude of their interpretations to the original 78rpm recordings. The consensus of an orthodox blues form and canon (Charters 1959, Dougan 2006) is understood as an idealisation and romanticisation of the form rather than an accurate reflection of the recorded legacy of country blues artists recorded in the 1920s and 1930s.

Drawing primarily upon the examples of two of country blues’ most influential musicians – Robert Johnson and Charley Patton – this paper uncovers key issues regarding time and performance in the blues, such as the controversy over the speed at which Johnson’s records were recorded (Wald 2004), the flexible approach musicians took to the 12-bar format (Fahey 1970) and the strictures that the three-and-a-half minute 78rpm record side posed for early blues artists’ songcraft (Oliver 1960, Wardlow 2000). How these factors challenge musicological orthodoxies over conventional blues formats and historical insights into the practice of the blues will be illuminated through the proposal that these early recordings struggle with contentious narratives of primitivism, racial stereotyping and authenticity (Hamilton 2007, Gatchet 2012), and that a pervasive romanticisation of the form has affected current orthodoxies of country blues’ rhythmic and temporal structures. I therefore argue that the performances found on 78rpm records are both reified to fit a prevailing narrative of the country blues as atavistic and authentic, whilst also being subject to fundamental reinterpretations by generations of musicians and listeners.
The everyday politics of musical time in the ballet world
Jonathan Still (Institute of Education)

In *Rhythmanalysis*, Lefebvre is critical of a tendency to attribute mechanical overtones to rhythms, ignoring the "organic aspect of rhythmmed movements." Musicians, as producers of rhythms, "often reduce them to the counting of beats [des mesures]: ‘One-two-three-one-two-three’" ([Lefebvre, 2004, p. 6]). His aim is to argue that the meanings of "rhythm" are obscure, and not reducible to counting.

Yet counting is itself a concept and practice whose meaning is too often taken for granted as "common sense,” particularly with regard to music. As Jeanne Bamberger concluded in her analysis of children’s drawings of musical rhythms, counting, at any age, is not a "neutral and 'objective' act,” but varies according to what a listener considers an object to be counted in the first place ([Bamberger, 1991, p. 273]).

The truth of this can be observed in the everyday life of ballet dancers and teachers, who regularly have to make sense of complex interactions between lived experience of music and movement, and representations of music through verbalization in counts, or in music notation. Textbooks on the subject sometimes refer to "dancers' counts" in opposition to "musicians’ counts" or “the music,” with the implication that musical notation and theory is authoritative and correct.

In this paper, drawing on ethnographic research in the ballet world, I examine how “time signature gets into everyday life” (to paraphrase Tia DeNora), and how in the process, a politics of musical time is often enacted that goes unquestioned because of common-sense assumptions about music theory and notation.
Day 3: Wednesday 14 September

Session A7
Sociality

It don’t mean a thing: the rhythm section and considerations of ‘hot’ and ‘cool’ in the music of Lennie Tristano
Marian Jago (University of Leeds)

The role of rhythm, and the rhythm section in jazz has often served as a flashpoint for discussions around the racial essence and musical ownership of jazz due to the politically charged space occupied by the drums; an instrument long coded as ‘black’ in cultural and musical discourse. Tied closely to this issue are considerations of identity formation in jazz, and the role that race plays in such discourse, both actively and passively. Though in many ways an under-researched figure, jazz pianist Lennie Tristano has frequently figured in such discussions, particularly with regard to his idiosyncratic employment of the rhythm section and the ways in which notions of musical authenticity in jazz are linked to concepts of rhythm.

This paper seeks to (re)locate these attitudes toward rhythm and rhythmic conception in jazz within a larger historical context while simultaneously (re)framing the discussion to include notions of artistic agency, performance practice, identity formation, and shared cultural ownership of jazz. In exploring Tristano’s employment of the rhythm section and the reasoning behind such artistic choices, scholarship by Paul Gilroy, Ronald Radano, and others will help to (re)define and (re)contextualize the ways in which modes of musical expression have historically been racially coded. Tristano’s approach to jazz performance, expressed through musical approaches often coded as ‘white,’ may be seen to have served as a means by which he could seek a form of jazz expression which was, in its avoidance of expressive features frequently coded as ‘black,’ authentic to his experience of the American cultural landscape.

Matters of taste and time in Anatolian Greek music
Panayotis League (Harvard University)

In this paper, I examine the intersection between the sense of taste and the sense of time in the musical practices of the Boston area's Greek-American community. Specifically, I focus on members of an extended family of musicians descended from immigrants from the island of Lesvos and the Aegean coast of Asia Minor, whose regional music and culinary traditions are distinctive, rich in historical and cultural significance, and deeply interrelated. My goal here is twofold: one, to propose a sensorium-centered theoretical framework for investigating how cultural knowledge is constructed at the intersections of sociality, music, and memory; and two, to tease out the specific ways in which the culinary and musical traditions of Lesvos and Asia Minor exist within each other in the cultural life of this immigrant community. I perceive this sensory symbiosis most tellingly on a level of what I call "didactic metaphor," in which the culinary terms "heaviness" and "drunkenness" are used to describe and prescribe the ideal temporal relationships performed in the music and steps of the zeitbekiko and karsilamas, the two dances most representative of the Lesbian tradition. Musical and culinary practices in this community are saturated with the co-presence of multiple times – historical, memorial, subjective, and musical pasts, presents, and futures – and an examination of this inherent polytemporality is essential to an understanding of how memory works in the lives of these musicians to create and sustain social bonds and reconcile individual and collective identities in the diaspora context.

Listening to North Indian classical music and the distribution of affect over time
Chloë Alaghband-Zadeh (University of Cambridge)

What kinds of temporalities are implicated when people listen to music? And how do particular cultures of listening and connoisseurship shape listeners’ experiences of being together in time during performances? More broadly, how might studying listeners illuminate the social construction of musical time?

With this paper, I explore some of the complex temporalities of North Indian classical music in performance. I focus on the experiences of so-called rasikas (connoisseurs). These expert listeners are conspicuous at concerts, where they sit towards the front and show their appreciation of the music by gesturing or commenting out loud. Based on interviews and ethnography with rasikas in Delhi, Mumbai and Pune, I consider how they experience musical time. In particular, I show how their experience of time is tied to what one listener described as the "vah vah moments": those moments in the performance when something in music causes listeners to respond with
their bodies or voices, often making the conventional comment "vah vah". These are moments of affective intensity: listeners described them as times of heightened emotion and they stress that their embodied and audible responses to the music are beyond their control. Here, I argue that rasikas' ways of engaging with music, specifically their ways of orienting themselves towards key moments, demonstrates the distribution of affective intensities over time. Rasikas experience performances not in terms of the even passage of time, but in terms of uneven structures of expectation and release. I argue that this temporal distortion, in turn, accounts for how some listeners come to experience performances as “timeless”. I also consider some of the broader social implications of this way of experiencing musical time, showing how it can serve as a way of performing social class.
Temporal impacts of music streaming technology on the listening experience
Geoff Luck (University of Jyväskylä)

Digital streaming technology represents the most radical development in the way we experience music since the invention of automatic playback technologies two centuries ago. From zero ownership and on-demand access to virtually all music ever recorded via a disconnected transaction, streaming services challenge previous conceptions of how music is defined, experienced and consumed. This paper focuses on the first two of these characteristics, zero ownership and on-demand access, and explores the impacts of each upon temporal components of the music listening experience. Streaming technologies enable instantaneous access to near-limitless libraries of sound and music, effectively removing all previous time constraints associated with music listening. Even the time required to decide what to listen to has effectively been eliminated by predictive technologies that serve up endless playlists tailored to one’s individual music preferences. In short, listeners are afforded an extraordinary, hitherto unseen level of temporal control over their experience of music. Part theoretical, part data-driven, this paper combines existing insights with findings from new interview and survey data. On-demand access to music we don’t own is shown to impact in both positive and negative ways on the three parties around which streaming services revolve: artists, listeners and service providers. Implications and recommendations for the continued co-existence of all three parties are discussed.

On the grid: a socio-technical perspective on the digital quantization of musical time
Landon Morrison (McGill University)

Over the last few decades, rhythmic quantization has become an increasingly widespread practice in many popular music genres, bringing with it significant implications for the way we experience musical time. In contrast to the expressive micro-rhythmic fluctuations found in human performance, quantization maps rhythmic values onto the rigid confines of an underlying metrical grid. Today it is contained as an editing feature in most digital audio workstations (e.g., “Beat Detective” in Pro Tools), and especially in the world of electronic music, its pervasive use has enabled an emergent aesthetic orientation.

Despite being a relatively recent development, rhythmic quantization can be situated within a much broader historical context, traced back through a network of technological inventions that encapsulate bits of knowledge about temporal experience: the metronome reflected the quantifiable units of absolute time, the pendulum represented time as embodied motion, and written notation crystallized the flow of time as an abstract representation. Extending these earlier technologies, digital quantization converts musical-sound-in-time into a malleable piece of information capable of being manipulated at the level of milliseconds; as such, it represents a major development within a long-running trend towards chronometric precision in contemporary culture. In order to explore this mutual mediation of technology and temporal experience, this paper offers a socio-technical account of rhythmic quantization by excavating the requisite knowledge that surrounded its development and examining the aesthetic consequences of its use for the way people create, perform, and listen to music.
Metonymic groove: the breakbeat as time capsule
Rowan Oliver (University of Hull)

Originally emerging as a fundamental process within hip hop production during the mid 1980s, the practice of digitally sampling extracts of solo drumming (or 'breakbeats') from 1970s funk records and then recontextualizing these rhythmic fragments in different stylistic settings has become widespread across a range of genres in contemporary popular music. As a result, the groove that is encapsulated in each breakbeat has continued to provide the rhythmic backbone for numerous subsequent recordings, and whilst producers will typically manipulate the sampled audio using techniques that range from the subtle to the extreme, a breakbeat's inherent groove nevertheless seems able to survive such transformative processes. A breakbeat can therefore be thought of as a time capsule (both in the sense that is from another time and that it contains timing information) that represents an ongoing rhythmic link between past and present.

Building on my research into groove, breakbeats and sampling, this paper will explore the way that producers working in such post-hip hop genres as jungle, footwork, UK garage and Baltimore club have opened various breakbeat time capsules in order to engage with the groove that they contain. Particular attention will be given to examples where only a very brief fragment from the original rhythm pattern is used; in these cases, the fragment can be seen as a metonym that stands for the full breakbeat, but one whose associations with its source groove are communicated to the listener more via timbral than rhythmic aspects.
**Session A8**  
**Philosophy II**

**To be in time: repetition, temporality, and the musical work**  
Nathan Mercieca (Royal Holloway, University of London)

A greater awareness of musical temporality, especially since the New Musicology, undermined several comfortable narratives about Western Art Music. Analysis especially had relied on a 'simultaneous' view of the musical work, allowing its properties to be explored spatially—for example, in Schenkerian or neo-Riemannian charts—rather than temporally. Theories of tonal architecture gave way to critical narratives, and studies in performance. The musical work is dead.

While much attention has been paid to the idea of 'musical time' (the temporal existence of musical phenomena in performance), earlier ontological critiques of musical analysis also implicitly stressed the temporal. Nicholas Cook's proposal (2003) that there is no Beethoven's 9th Symphony—'instead of a single work located "vertically" in relation to its performances [...] we have an unlimited number of instantiations, all on the same "horizontal" plane'—invokes music's 'historical time'. This is a much larger temporal sweep, enveloping individual 'musical times'. This gives rise to a tension: which temporality to deal with first—the musical time of the 'piece', or the historical time that problematizes it?

While Deleuze is frequently invoked to justify such scepticism about the ontological coherence of music, a more careful application of his theories might point the way back out. Deleuze, too, considers horizontal "repetitions" in time, but explicitly subordinates them to vertical one, which he characterizes as 'metaphysical in accordance with the difference and excess of the always positive Idea'. Deleuze's temporality, then, makes room for—indeed, requires—what might turn out to be a rehabilitated idea of the musical work. Drawing out these strands through comparison with Heidegger and Badiou, a Deleuzian reading of repetition in Mahler suggests a new approach in which traditional analytic and musical-theoretic tools explore, and perhaps explain, music's ramified temporality.

### Layers of musical time in progressive rock songs

Nick Braae (Waikato Institute of Technology)

This paper addresses the notion of musical time as articulated in progressive rock songs. Musical time, in this context, refers to the conceptual or metaphorical journey on which one travels while listening to and experiencing a piece of music (Kramer 1988). It has been suggested previously that this idea may be useful in understanding the nature of progressive rock (Moore 2001), but, to date, analyses of this kind have been scarce (Holm-Hudson 2002).

In this paper, I argue that one of the key traits of progressive rock, as a broad style, was the layering of different temporalities within large-scale songs. Two distinct temporalities, in particular, are discussed with reference to a number of tracks. Firstly, it is common to find “vertical” musical surfaces—looping rhythmic and harmonic patterns, constant textures within sections and declamatory vocal lines evoke a sense of temporal stasis. Songs by Yes ('Awaken', 'Close to the Edge', 'Roundabout') and Pink Floyd ('Shine on You Crazy Diamond') typify this feature. Secondly, this low-level vertical stasis is often balanced by large-scale linearity, via grandiose textural gestures and recapitulation of initial material. Songs by the same artists as well as Jethro Tull ('Aqualung') and Queen ('The Prophet’s Song') highlight this trend.

I suggest that these contrasting temporalities elucidate the contradictory aesthetics of the progressive rock movement. On the one hand, the surface stasis betrays progressive rock's origins in 1960s psychedelic music, and its desire to continue the previous decade's countercultural ideals. On the other hand, the large-scale linearity points to the high culture aspirations of this movement; this trait is connected with the formal processes of the 19th-century classical repertoire (Macan 1997). The concept of musical time may thus be useful not only as an analytical tool, but for understanding in the socio-cultural dimension of this body of popular music.
The perception of metre: Hasty's theory of projection meets Husserl's structure of time consciousness
Philip Boast (University of Nottingham)

This presentation applies a phenomenological understanding of time consciousness to the most elementary temporal aspect of music performance, namely metrical pulse. In Metre as Rhythm (1997), Christopher Hasty argues against a commonly held supposition that metre corresponds to the objective measurement of time, standing in contrast to an animated and sensuously given sense of rhythm. Hasty describes metre as 'the most purely temporal of music's components', and 'the most active, energetic, and palpably rhythmic of musical properties', and accordingly, metre amounts to more than the mere counting-off of successive moments. For Hasty, the issue is one of setting out a relationship that allows for a communication between metre and rhythm without collapsing the distinction between the two, and to this end he conceives of metre as the product of a conscious and ongoing act of temporal projection. Hasty's position uncritically assumes a perceptual capacity to directly sense and anticipate time periods, so a question that remains is how best to analyse and articulate this ability. I suggest we can gain an insight into the perception and projection of temporal duration through Edmund Husserl's phenomenology of time consciousness. Husserl sets out to account for two related phenomena: the sense of an event departing into the past, or 'temporal fading', and the sense of an event enduring in time, that is, 'temporal duration'. Arguing that both of these phenomena play a role in Hasty's projection of metrical pulse, I will make the case that Husserl's model of time consciousness offers an illuminating path for understanding the processes at play in the perception of metre.
**Session B8**
**Interpersonal III**

*Palaran: flexibility, coordination, and control of timing in a Javanese, multi-player accompaniment genre*

Jonathan Roberts (Universities of Oxford and Cardiff)

This paper explores the issue of timing and collaboration in *palaran*, a form of ensemble-accompanied, singing in the gamelan repertoire of Central Java.

*Palaran* are derived from the melodies used to recite texts written in Javanese poetic metres. In its original form this is an unaccompanied, solo tradition where personal preference and syllable-breaks control pacing and speed. When used as *palaran* however these melodies are supported by a metrically fixed structure of instrumental notes and surrounded by a web of spontaneous melodic accompaniment, involving eight players. The balance of control over timing shifts between musicians throughout a *palaran*. Initially the singer is free to alter pace and add ornamentation at will whilst the instrumentalists follow their lead, repeating the next fundamental target pitch until this is reached and then changing note all while remaining within a fixed rhythm structure. At the end of some lines, however, a particularly strongly felt cadence requires a large gong note and at these points a complex sequence of events is enacted in order to coordinate a simultaneous arrival by the singer, drummer, and other instrumentalists. The aesthetic principles of Central Javanese gamelan demand that this should be achieved smoothly and without any noticeable deliberation.

This presentation examines the complex ways in which multiple musicians control, negotiate, and coordinate timing in this flexible yet precise form of musical interaction. It examines the rules of ideal cohesive performance, the transmission of strategies for successfully learning how to achieve this, and what can be learnt from occasions when *palaran* go wrong and the coordination of timing goes awry.

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*Synchrony, sociality, and collective performance from the lab to the field: some evidence from the Sultanate of Oman*

Bradford J. Garvey (City University of New York)

There is mounting experimental evidence to support a direct link between collective performances, the elicitation and management of powerful shared emotions, and the subsequent promotion of prosocial behaviors. Rhythm, especially, has been identified as a crucial musical parameter in promoting social bonding and increasing social cooperation because it assists the maintenance of interpersonal synchrony via a shared sense of time. Various experiments show that as groups synchronize their movements and entrain to a common rhythm, they come to identify and act as a group, showing increased levels of group trust, willingness to cooperate, and generosity. While these experiments appear to show that the link between entrainment, synchrony, and sociality is straightforward, field research reveals that successful collective performances vary widely in levels of synchrony, participation, and coordination. These vagaries of collective performance, called ‘participatory discrepancies’ by Charles Keil, may facilitate the production and reception of collective performance and hence social bonding. Many laboratory experiments attempt to isolate rhythmic synchrony by drastically simplifying musical participation or by imposing unrealistic constraints on participants, which, while necessary in the lab, fail to reproduce fundamental aspects of collective performance in natural settings. How can we reconcile these lab results with the realities of collective performance, and how can the insights of lab and field research be combined? In this presentation, I attempt to reconcile lab research on synchrony, entrainment, and social bonding with my own fieldwork amongst Arab men of the Interior region of the Sultanate of Oman, whose primary performance practice, collective war dances called *razha*, exhibits many of the features isolated in experimental research. I contend that by taking seriously the findings of the lab and the realities of field research, we can trace the variance and differential realizations of the behavioral results of synchrony, entrainment, and collective performance.
The art of conversation: timing and gesture in ensemble performance
Satinder Gill and Sheila Guymr (University of Cambridge)

The famed French hostess Madame de Staël contrasted the playful, ephemeral art of conversation with the deliberate techniques of oratory, commenting that the pleasure produced by a lively conversation does not precisely depend on the nature of that conversation; the ideas and knowledge which it develops do not form its principal interest; it is a certain manner of acting upon one another, of giving mutual and instantaneous delight, of speaking the moment one thinks, of acquiring immediate self-enjoyment, of receiving applause without labor, of displaying the understanding in all its shades by accent, gesture, look; of eliciting, in short, at will, the electric sparks, which relieve some of the excess of their vivacity, and serve to awaken others out of a state of painful apathy.
(Quoted in Edward Klorman, 2016: 24)

De Staël’s comments aptly describe the joy of performing chamber music with friends, highlighting those exquisite moments in ensemble performance that flow from a shared understanding of time. In this paper, we analyse video material of a string quartet and a piano trio rehearsing chamber pieces by Haydn to delve into the metaphor of ensemble performance as ‘a conversation amongst friends’. Our focus is on the sharing of tacit knowledge during expert performance. Drawing on research conducted by Gill into the dynamics and structures of spoken dialogue that shape tacit knowing, and Guymr’s extensive experience as a chamber musician, we seek to investigate just how deeply, and in what ways, the metaphor of conversation may apply to musical performance. We examine those collective acts – those moments of acknowledgement and agreement – that have a different quality of timing from the background of sound and gesture from which they emerge. The study thus explores the relations between rhythmic synchrony, inter-subjectivity, and communication as performance.
Music is pregnant with insights in regard to theorising time, but how can we build on existing developments? Until very recently the music disciplines focused primarily on music’s ‘inner time’, its capacity to create multiple sounding forms of unfolding temporal experience — what in this conference is gathered under sessions headed ‘MetreRhythmTempo’ and ‘Psychology’. Recently, attention has turned also to the kinds of temporal experience engendered by the socialities of ensemble music-making, signalled by sessions on ‘Sociality’ and the ‘Interpersonal’ in the programme. Yet further sessions are curated under the heading ‘Temporality and History’. All of this bodes well, and without doubt the conference signals a rich opening out conceptually to the multiple scales and forms in which music makes time and historical time makes music. In this interdisciplinary paper, with reference to the anthropology of time, art and cultural history, philosophies of time — including Bergson, Husserl, Deleuze and William Connolly — and what has been called the material turn, I want to stimulate further and intensify this opening out, and in particular the attempt to cross scales in analysing the mutual mediation of music and time. I propose several linked departures: the need to analyse the multiplicity of time in music (and cultural production); the contributions of the musical object or event — as a nonhuman actor — to the production of time in not one but several dimensions of temporality; and the importance of bringing such thinking into articulation with new forms of historical explanation (in contrast to recent trends in theorising music history, such as the ‘quirk historicist’ debate (Mathew and Smart, 2015)).

Three ethnographic vignettes drawn from the *MusDig research programme exemplify these departures: the first draws out the multiple temporalities at play historically in the invention of a spate of new digital popular music genres in Nairobi, Kenya in the early 2000s, foremost among them *kapuka*; the second focuses on digital art musics, in particular the transnational neo-modernist genre microsound, probing the links between its aesthetic orientation and materialist temporal ontology, and how it performs a variety of historical relations to the music of ‘ancestors’ Xenakis and Cage; and the third indicates, through the case of the complex, ricocheting temporal relations set up between Montreal musicians Jean Piché and Roger Tellier-Craig as they participate in the ‘hauntology’ continuum, the heightened, hyper-reflexive qualities of present-day engagements with time and history in digital crossover musics, demonstrating the urgent need for theoretical frameworks equal to the sophistication of today’s creative practices. The final section of the paper returns to music listening, departing radically from notions of structural listening and Adornian accounts of musical experience by developing the implications of a Bergsonian understanding of time.

* MusDig — Music, Digitisation, Mediation: Towards Interdisciplinary Music Studies — was a large five-year research programme (2010-15) funded by the European Research Council, directed by Georgina Born and based at the Music Faculty in Oxford. MusDig encompassed nine ethnographic studies, most of them multisited, carried out by myself and a team of nine researchers. In this paper I am indebted to Dr Andrew Eisenberg for the Kenya study, Dr Chris Haworth for the microsound study, and Dr Patrick Valiquet for the Montreal study.
Presenter biographies

Chloë Alaghband-Zadeh
Chloë Alaghband-Zadeh is a Research Fellow at Emmanuel College, University of Cambridge. Her research is on North Indian classical music, which she studies through a combination of ethnography and music analysis. She is currently working on a project on expert listening in North Indian classical music.

Joshua Bamford
Joshua completed his B.Mus.(Hons)/B.Sc. in Musicology and Psychology at the University of Western Australia, and is now working towards an M.A. in Music, Mind and Technology at the University of Jyväskylä, which he will complete after an exchange semester at the University of Vienna.

John C. Bispham
John is affiliated with the Centre for Music and Science at the University of Cambridge where he studied music psychology and biological anthropology with Professor Ian Cross. He also graduated in vocal and opera studies from the Royal Northern College of Music. Academic interests include, in particular, evolutionary perspectives on music, and all comparative debates on the specificities of music and its many functions, contexts and efficacies.

Philip Boast
Philip Boast is a PhD postgraduate at the University of Nottingham, having qualified for a M.A. in Music Performance at the University of Salford. His research concerns music performance from a phenomenological perspective, with a particular focus on the embodied and intersubjective dimensions of the experience of musical time.

Alexander Bonus
Alexander Bonus, PhD is Assistant Professor of Music at Bard College (NY, USA) and Founding Director of the Bard Baroque Ensemble. He previously taught theory and directed the collegium at Duke University. In 2011 Dr. Bonus received a competitive New Faculty Fellowship from the American Council of Learned Societies. His scholarly writings appear in the latest Grove Dictionary of Musical Instruments, Current Musicology, and the forthcoming Cambridge Encyclopedia of Historical Performance. Dr. Bonus authored the "Handbook to the Metronome" (2014) for Oxford Handbooks Online. As a keyboard continuo player and brass instrumentalist, he has performed with professional early-music ensembles throughout North America.

Georgina Born
Georgina Born FBA OBE is an anthropologist and cultural theorist who worked earlier as a cellist and bass player in improvised music, avant-garde jazz and rock. She is Professor of Music and Anthropology at Oxford University and recently held visiting professorships at McGill and Oslo Universities and University of California, Berkeley. From 2010-15 she directed the European Research Council-funded research program 'Music, Digitization, Mediation: Towards Interdisciplinary Music Studies'. Her books include Rationalizing Culture: IRCAM, Boulez, and the Institutionalization of the Musical Avant-Garde (1995), Music, Sound and Space (ed., 2013), Interdisciplinarity (co-ed., 2013) and Improvisation and Social Aesthetics (co-ed., forthcoming in 2017).

Andrew Bowsher
Andrew Bowsher has a D.Phil in Social and Cultural Anthropology from the University of Oxford (2015). His research interests include independent music industries, record labels, sound recording and record collecting.

Nick Braae
Nick Braae is an Academic Staff Member in Music at the Waikato Institute of Technology where he lectures in composition, theory and music history. He completed his PhD at the University of Waikato in 2016 on Queen, and has published several articles and a book on the group's music.

Ryan Bruce
Dr. Bruce completed his PhD at York University in 2013 with a dissertation on the music of Thelonious Monk performed by saxophonists Charlie Rouse and Steve Lacy. His research interests include jazz theory and analysis, group interaction in improvisation, and jazz historiography.
Alec Cooper
Alec Cooper is a PhD student at the University of Edinburgh. His research explores the correlation between musical interactions and feelings of musical connectivity among sitar and tabla performers through a combination of ethnographic and empirical methods. Alec also plays and teaches sitar, and is co-director of the Sitar Project, Edinburgh.

Ellen Davies
Ellen Anne Davies is a DPhil student at Oxford University, researching music and temporality in 1913 Paris. She is the Founding Editor of Noise & Silence, an online platform for accessible musicological research. Ellen is supervised by Professor Jonathan Cross and funded by a Halstead Scholarship and a Europeaum Jenkins Scholarship.

Marc Duby
The bassist Marc Duby began his musical career in Cape Town in 1972. Awarded the first masters’ degree in jazz performance (cum laude) in Durban 1987, he completed his PhD thesis in 2007 on the topic of Soundpainting. An NRF-rated researcher and award-winning composer of film music, Duby is active as a performer, and serves as Research Professor in Musicology at the University of South Africa.

Timo Fischinger
Timo Fischinger is a Post-Doc researcher at the Max Planck Institute for Empirical Aesthetics in Frankfurt am Main, Germany. He holds a doctorate degree (Dr. phil.) in Systematic Musicology along with a degree in Music (Staatsexamen). He was a Visiting Professor (Junior Professorship) at the Humboldt University Berlin.

Olivier Fluchaire
Hailed by the press as “a spectacular virtuoso, [playing] with effortless brilliance, unbridled passion, and a remarkable flair,” French born violinist Olivier Fluchaire serves as an Assistant Professor at Manhattanville College (New York, USA). His research focuses on the history and manufacture of the bow, the violin’s inseparable companion- more at www.OlivierFluchaire.com.

Kae Fujisawa
Kae Fujisawa, native of Japan, received a Bachelor’s degree in Philosophy from Tokyo Women’s Christian University and a Master’s in Music History from Hunter College, The City University of New York (CUNY). She is expected to complete her Ph.D. in Musicology at The CUNY Graduate Center in September 2016.

David Kirkland Garner
David Kirkland Garner is a composer, teacher and scholar, currently an Assistant Professor of Composition and Theory at the University of South Carolina. David writes chamber music, plays banjo, studies fiddle, listens to jazz, hears everything, knows nothing.

Bradford J. Garvey
Bradford J. Garvey is a doctoral candidate in Ethnomusicology at The City University of New York’s Graduate Center. His research focuses on the social and historical roles of collective music making practices in the contemporary Sultanate of Oman, taking an analytic and cognitive approach. This research is currently funded by The Wenner-Gren Foundation for Anthropological Research in New York City. Questions and comments can be addressed to bgarvey@gradcenter.cuny.edu.

Rolf Inge Godøy
Rolf Inge Godøy is professor of music theory at the Department of Musicology, University of Oslo. His main interest is in phenomenological approaches to music theory, meaning taking our subjective experiences of music as the point of departure for music theory.

Mark Gotham
Mark Gotham graduated from Oxford with the Gibbs prize for the top first class degree in music; from the RNCM with an MMus in composition; and from Cambridge with a Ph.D. on musical metre. He is now a visiting lecturer at Cambridge and Director of Music at Churchill College.
Anthony Gritten
Anthony has published in visual artists’ catalogues, philosophy dictionaries, and on subjects including Stravinsky, Cage, Delius, gesture, distraction, problem solving, ergonomics, listening, and technology: [https://ram.academia.edu/AnthonyGritten](https://ram.academia.edu/AnthonyGritten). A Fellow of the Royal College of Organists, his performances have included UK and Canadian premieres of Daniel Roth, and complete cycles of the works of Tunder, Buxtehude, Homilius, Mendelssohn, and Brahms.

Gérald Guillot
Gérald GUILLOT (PhD) is graduated in Musicology, Music Pedagogy and Computer Science. Associate professor at the High School of Teacher Education (Lausanne, CH), he has been studying traditional music for 25 years, moreover in Brazilian area. His works focuses on musical temporality of Afro-Diasporic cultures, interculturality and music pedagogy. website : www.gerald-guillot.fr

Randall Harlow
Randall Harlow is Assistant Professor of Music Theory and Organ at the University of Northern Iowa (USA). His research focuses on empirical study of performance and hyper-acoustic music technology from the perspectives of embodied cognition, gesture, and Gibsonian ecology. He holds a DMA from the Eastman School of Music.

Bryn Hughes
Bryn Hughes is Assistant Professor in the Department of Music at the University of Lethbridge, in Lethbridge, Alberta, Canada, where he teaches courses in music theory. His primary research interests include music cognition, music theory pedagogy, and popular music.

Jin Hyun Kim
Jin Hyun Kim, PhD, is an assistant professor of Systematic Musicology at Humboldt University of Berlin. She studied Musicology in Seoul and Germany. Currently, she is Speaker of the study group "Key Topics in Basic Music Research: Interdisciplinary Music Research and Philosophy of Music Today" funded by the Hanse Institute for Advanced Study.

John Paul Ito

Vijay Iyer
Composer-pianist Vijay Iyer is the Franklin D. and Florence Rosenblatt Professor of the Arts at Harvard University. He was voted *Downbeat* Magazine’s Jazz Artist of the Year for 2012, 2015, and 2016, and he has received a MacArthur Fellowship, a Doris Duke Performing Artist Award, and a Grammy nomination. His recordings include *A Cosmic Rhythm with Each Stroke* (ECM, 2016) in duo with Wadada Leo Smith, and *Break Stuff* (ECM, 2015) with his trio. His writings have appeared in *Journal of Consciousness Studies, Wire, Music Perception, Journal of the Society for American Music, Critical Studies in Improvisation*, and *The Oxford Handbook of Critical Improvisation Studies*.

Marian Jago
Marian Jago is currently a lecturer in Popular Music at the University of Leeds, where her research interests include improvisation, jazz studies, pedagogy, and the music of Lee Konitz and Lennie Tristano.

Marko Jouste
Ph.D. Marko Jouste is an ethnomusicologist and a musician. As an ethnomusicologist Jouste has worked in the field of the Saami musical traditions of which he made his Ph.D. in 2011. He works in the Giellagas-institute in Oulu University as a Doctoral Researcher funded by the Academy of Finland.

Sverker Jullander
Sverker Jullander, PhD, Professor of Musical Performance at Luleå University of Technology, is internationally active as a musicologist and organ recitalist, specializing in the organ and church music of the late nineteenth and early twentieth centuries. He is Chair of the Research Committee of the Royal Swedish Academy of Music.
Ryan Kirkbride
Ryan is studying for a White Rose College of Arts and Humanities (WRoCAH) funded PhD in Music Psychology coupled with Computer Science as part of the WRoCAH network researching expressive nonverbal communication in ensemble performance.

Kristina Knowles
Kristina Knowles received her Ph.D. from Northwestern University in Music Theory with a specialization in Music Cognition and currently teaches in the School of Music at Arizona State University. Her dissertation, "The Boundaries of Meter and The Subjective Experience of Time in Post-Tonal, Unmetered Music" argues for an in-time and processive approach to the study of rhythm and meter in contemporary compositions that are predominantly unmetered, with a focus on the perceptual effect these musical structures may have on the subjective experience of time while listening.

Panayotis League
Panayotis (Paddy) League is a PhD candidate in Ethnomusicology at Harvard University, where he researches traditional music, oral poetry, and material culture in insular Greece and Northeastern Brazil. His dissertation, "Echoes of the Great Catastrophe: Re-Sounding Anatolian Greekness in Diaspora," explores the sonic world of Greek refugees from Asia Minor.

Mikyung Lee
Mikyung Lee, PhD, is an associate professor at Chonnam National University in Korea. She studied Musicology in Seoul and Germany. Currently, she is a chief investigator of the joint research project funded by the National Research Foundation of Korea on the aesthetic experience of entrainment in Korean shaman ritual music.

Juan Loaiza
Juan is a candidate for a PhD in music and sonic arts at Queen's University Belfast. Juan's interests lie in the crossroads of the practice of music, community-participatory projects, and philosophy. He has received a master in music composition at Newcastle University and a Bachelor in Design Engineering in Colombia.

Diane Luchese
Diane Luchese is a Professor of Music Theory at Towson University in Maryland and also a freelance organist/choir master. Her interests include counterpoint; pedagogy as informed by cognition research; rhythm, time and motion; the music of Messiaen; and performing early and contemporary works. She earned a PhD from Northwestern University.

Geoff Luck
Geoff Luck is Associate Professor at the Finnish Centre for Interdisciplinary Music Research at the University of Jyväskylä. An expert on music perception and cognition, his professional interests range from studying the neurological, physiological and behavioural effects of sound and music to developing engagement-enhancing technology for the entertainment industry.

Francis Maes
Francis Maes (1963) is professor in musicology at Ghent University (Belgium). From 1996 to 2002, he directed the Flanders Festival. He published a textbook on Russian music history, contributed to the Cambridge Companion to Shostakovich, and published articles on Janáček, Martinů, Shostakovich and contemporary opera staging.

Nathan Mercieca
Nathan is in the fourth year of an AHRC-funded PhD, supervised by Professor J. P. E. Harper-Scott. His work centres around the ethics of musicology, examining the philosophical and political implications of musicological engagement, and focusing specifically on the analysis of tonal music. He is Teaching Associate at Gonville & Caius College, Cambridge, and maintains a parallel career as a countertenor, singing with some of London’s principal churches and ensembles.

Landon Morrison
Landon Morrison is currently pursuing a PhD in music theory and working as a course lecturer at the Schulich School of Music of McGill University in Montreal, Quebec. Additionally, he is a member of the Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT).
Guilnord Moufarrej
I am an assistant professor in the Languages and Cultures Department at the United States Naval Academy. My research interests include issues of musical transmission and identity in the Maronite Church in Lebanon and the diaspora; music and social protest in the Arab World; music, social media, and children exploitation; and music and emotions. I have published articles on the liturgical reform of Maronite chant and the Maronite funeral ritual. I have also contributed to the online documentary “Songs of the New Arab Revolutions.” Currently, I am writing an article on the exploitation of the children of Syria through songs and another article on the musical soundscape of weddings among Arab Americans.

Micah Anne Neale
Micah Neale hails from Milton Keynes. A music graduate of Royal Holloway, University of London, she is currently completing her MMus at RHUL with the assistance of a Christopher Mayled Scholarship in Historical Musicology. She will soon begin a PhD, also at RHUL, studying the musical lives of 18th-century servants.

Jarkko Niemi
Jarkko Niemi, Ph. D., University Lecturer. As an ethnomusicologist in Music Studies of the University of Tampere, Finland, Niemi has made contributions in utilizing and developing qualitative and data-sensitive methods especially in the field of ethnography of music. His research interests are associated with performance and textualisation of oral culture.

Yoojin Oh
Pianist Yoojin Oh has toured throughout Europe, America and her native Korea. Her passion for shading light on unknown pieces was recently featured in the New York premiere of Eduard Tubin’s Piano Concertino and the critically acclaimed New York premiere of Vaughan Williams Piano Concerto in C. Dr. Oh currently serves on the faculty at the College of Staten Island, City University of New York.

Rowan Oliver
Rowan’s research focuses on Black Atlantic rhythm culture, dealing with groove, breakbeats, sampling, and the musician’s relationship with time and sound. He recently carried out funded archival research at the Center for Black Music Research in Chicago. Alongside his academic career, Rowan continues to record and perform as a multi-instrumentalist.

Michelle Phillips
Michelle’s research focusses on empirical investigation of the experience of duration whilst listening to music. Michelle is currently investigating the effect of expectation and predictability in music on psychological time, and the effect of beta blockers and mindfulness meditation on a performer’s timing productions and decisions.

Jonathan Roberts
Jonathan Roberts holds a DPhil in ethnomusicology, with a thesis examining community gamelan groups in Central Java. He is currently working on a project mapping the soundscape of a Javanese palace. Other research interests include the interactions between texts and their musical interpretation, and issues of communication in cross-cultural performance.

Jonathan Still
Jonathan Still is a professional ballet accompanist, music producer and AHRC funded, fifth-year part-time doctoral student at UCL Institute of Education, exploring music as relational practice in everyday life in the ballet world, supervised by Lucy Green.

Martha Sullivan
Martha Sullivan is a PhD student at Rutgers University (New Jersey, United States). Her dissertation on the Siren topos applies feminist theory to the semiotics of musical topic theory. Sullivan has taught at Boston University, New York University, and Rutgers. She is also an award-winning composer of vocal music.

Petter Sundkvist
Petter Sundkvist, Professor of Orchestral Conducting at Luleå University of Technology, has appeared with major symphony orchestras in numerous European countries and has recorded more than 40 CDs. A member of the Royal Swedish Academy of Music, he was elected to the board of the Academy in 2016.
Sundeep Teki
Sundeep Teki is a Sir Henry Wellcome Postdoctoral Fellow based at the Auditory Neuroscience Group at the Department of Physiology, Anatomy and Genetics, University of Oxford. He has carried out several neuroimaging experiments on how the brain encodes time intervals in rhythmic sequences and currently studies sequence learning in the auditory cortex. Web: http://sundeepteki.org

Renee Timmers
Dr Renee Timmers is Senior Lecturer in Psychology of Music at the University of Sheffield. Her research concerns expressive timing in solo and ensemble performance, music as a multimodal experience, and perception and experience of emotion in music.

Finn Upham
Finn Upham is a PhD candidate at New York University investigating how and when listeners breathe to music. She previously studied continuous measurement of emotional responses to music with Stephen McAdams at McGill University while studying mathematics, music theory, and music technology.

Sarah Vandemoortele
Sarah Vandemoortele received musical training as a violinist at the Royal Academy of Music (London) and studied musicology at KU Leuven. As research assistant at LUCA School of Arts (Leuven) she contributes to the pilot project ‘Into the Wild: Musical communication in ensemble playing. From multidisciplinary to interdisciplinary research strategies.’

Samuel Wilson
Samuel Wilson is based at Guildhall School of Music and Drama and London Contemporary Dance School, after completing his PhD at Royal Holloway in 2013. His research explores musical aesthetics and subjectivity in the context of recent modernity. He is currently editing an essay collection on music and psychoanalytic theory.

Thomas Wolf
Thomas Wolf studied Musicology (MA 2011) and Cognitive Science (MA 2014) at the University of Vienna. In 2011/2012, he participated in the program for Phenomenology and Philosophy of Mind at the University of Copenhagen. He is currently a PhD candidate in Cognitive Science at the Central European University in Budapest.

Naomi Woo
Currently a PhD student, Naomi Woo holds degrees in mathematics & philosophy, musicology, and piano performance from Yale University, the University of Montreal, and Cambridge. She is active as a pianist and conductor in the UK and Canada, and is co-artistic director of the sonic and choreographic collective Tick Tock.

Karina Zybina
Karina Zybina took her master’s degree in musicology at Moscow Conservatoire in 2011. In 2011-12, she held a fellowship at University of Zurich. Since 2012, she carries out a doctoral project at University Mozarteum Salzburg (supervisor – Prof. Thomas Hochradner). Since 2015 she works as a research assistant at Karajan Institute.
Socialising in Oxford

This is a very small selection of places to eat and drink after hours and if you have some free time in Oxford.

Pubs

The Bear [http://bearoxford.co.uk/]
Reputed to be the oldest pub in Oxford, dating from 1242. Very atmospheric; small interior and can be crowded. From the Faculty, walk up St Aldate's and past Christ Church; just before the Town Hall, turn right into Blue Boar Street. The Bear is 100 yards down this street on the left. 6 Alfred St, OX1 4EH

The Head of the River [http://headoftheriveroxford.co.uk/]
On the banks of the Thames at Folly Bridge, about 300 yards further down St Aldate's from the Faculty. Plenty of seating outside and in and serves food. Folly Bridge, St Aldate's, OX1 4LB

King's Arms [http://www.youngs.co.uk/pub-detail.asp?PubID=420]
Licensed since 1607 to serve beer and cram as many bodies as possible into its alcoves and snugs; often very crowded but something of an Oxford institution. On the corner of Broad Street and Holywell Street, a ten-minute walk from the Faculty. 40 Holywell Street, OX1 3SP

Old Tom
A good pub in St Aldate's just up the road from the Faculty. In addition to a wide range of beers, also serves (as you would expect) Thai food. 101 St Aldate's, OX1 1BT

The White Rabbit
Pub serving excellent and reasonably priced pizza. Friars Entry, OX1 2BY

Cafés/restaurants

Covered Market
Oxford’s central market contains about 4 or 5 decent coffee shops. There are a number of entrances to the market at the top end of the High Street (before the Mitre Hotel). Closes 5pm. The market is definitely worth a visit if only to enjoy its unique collection of butchers, cheese-shop, fishmongers etc and numerous gift/clothing stores.

Café Loco [http://www.goingloco.com/]
On the opposite side of St Aldate’s from the Faculty; good coffee, sandwiches etc – eat in or take away. Closes early evening. The Old Palace, 85/87 St Aldates, OX1 1RA

The Missing Bean [http://www.themissingbean.co.uk/]
‘(Probably) the best coffee in town’. Their (modest) motto says it all. 14 Turl Street, OX1 3DQ

Quod Brasserie [http://www.quod.co.uk/]
Formerly a bank - now hotel and brasserie. Half way down the High Street and a place to have more substantial meals. 92-94 High St, OX1 4BN

Zappi's Bike Café [http://www.zappisbikecafe.co.uk/]
Bikes downstairs, excellent coffee, cakes and toasted sandwiches upstairs. 28-32 St Michael's St, OX1 2EB
Practical information and map

Contact numbers
Emily Payne: +44 (0)7816 401211
Mark Doffman: +44 (0)7711671647

Venues

Faculty of Music (conference venue)
St Aldate's
Oxford
OX1 1DB
Reception: +44 (0)1865 276125 (open 09:00-18:00 Tuesday to Thursday; 09:00-14:00 Friday)

Pembroke College (conference dinner, Monday 12 September)
Pembroke Square, Oxford OX1 1DW

The Spin Jazz Club (venue for evening social on Tuesday 13 September)
Upstairs at The Wheatsheaf Pub
129 High Street, Oxford OX1 4DF

Travel

Oxford Train Station
Botley Road
Oxford OX1 1HS

National Rail Enquiries
http://www.nationalrail.co.uk/stations/OXF/details.html
+44 (0)8457 48 49 50

Oxford Bus/Coach Station
Gloucester Green
1 Gloucester Street
Oxford OX1 2

Two coaches operate between central London and Oxford – the Oxford Tube and X90. Both companies stop at St Aldate's (2 minutes from the Music Faculty) before stopping at Gloucester Green coach station.

Oxford Tube
www.oxfordtube.com
+44 (0)1865 772250

Oxford Bus Company
www.oxfordbus.co.uk
+44 (0)1865 785400
There are regular bus services from Oxford Gloucester Green bus station to all London airports, Heathrow, Gatwick, Luton and Stanstead. These routes are mainly operated by National Express, and to get the cheapest fares you need to book online in advance.

National Express
www.nationalexpress.com/coach
+44 (0)871 781 8181

Taxi companies
001 Taxis
www.001taxis.com
+44 (0)1865 240000

Oxford Cars (Oxford Taxis)
www.oxfordcars.co.uk
+44 (0)1865 4060

Wi-Fi
Wi-Fi internet access is available to all delegates throughout the conference. You can request the access code when you arrive at the Faculty. Oxford University is also a member of Eduroam.

Map
If you have problems on arrival in the UK or need to get in touch, you can contact us as follows:

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