

2nd International Conference MÚSICA ANALÍTICA
Centre for Interdisciplinary Studies– University of Coimbra



**Interdisciplinary
Approaches
to Musical Time**

October 12–14, 2023 · University of Coimbra
FACULTY OF ARTS AND HUMANITIES (Faculdade de Letras)

2nd International Conference MÚSICA ANALÍTICA

Centre for Interdisciplinary Studies – University of Coimbra

Interdisciplinary Approaches to Musical Time

Welcome!

We are delighted to welcome you to Coimbra for the 2023 *Música Analítica* conference, which provides a forum for scholars from the various musical and music-adjacent disciplines to share research on how musical time is created and interpreted in the mind and body, by artists and listeners, across the broad sweep of history and culture. Our attraction to this topic stems from our observation that there is an impressive volume of recent and exciting work in multiple academic fields, many of which have little natural contact with each other: in the musical subfields of analytical and mathematical music theory, historical musicology, and ethnomusicology; in allied humanities such as poetics, philosophy, film, dance, and classical studies; and in behavioral and technology-focused disciplines such as perceptual and cognitive psychology, neuroscience, and computer science. We are excited about the present programme of *Música Analítica*; it assembles a variety of disciplinary perspectives which situate and advance our knowledge on musical time, and will surely lead to vigorous and enriching debates.

Our most ambitious aspiration is to provide a platform from which might arise opportunities for a more interconnected intellectual community, and for future collaborations involving research on musical time. To this end, we have invited three outstanding scholars to deliver keynote talks, addressing emerging approaches to musical time from distinct disciplinary angles. We have also invited a distinguished panel of senior scholars to deliver shorter plenary talks and to participate in a Saturday-afternoon valedictory session. These scholars have been asked to survey the work to which they have been exposed at this conference, to informally address the potential for productive cross-disciplinary clusters or binary connections, and to identify the most difficult intellectual and structural challenges, as well as ideas concerning how a newly forming community might address them.

In preparing this conference, we have benefitted from the enthusiastic participation of dozens of colleagues. We are grateful for the rigorous and creative work of the Programme Committee, who has met a number of times, in different time zones around the globe, to put together the present Programme; we are also thankful for the generous and meticulous work of the Scientific Board of 57 colleagues who advised the Programme Committee and gave insightful feedback to authors; and we thank the for their tireless and expert work Arrangements Committee of the Centre for Interdisciplinary Studies, the institutional partnership of the Faculty of Arts and Humanities of the University of Coimbra, and the financial support of the Foundation for Science and Technology.

We wish you a stimulating conference.
Enjoy Coimbra!

José Oliveira Martins & Richard Cohn

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Coordenação José Oliveira Martins and Richard Cohn
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Programme

TIME	THURSDAY, OCTOBER 12	
9H	REGISTRATION	
	ANFITEATRO III	
9H30	OPENING João Ramalho Santos , Vice-rector for Research, UC Delfim Leão , Vice-rector for Culture and Open Science, UC Albano Figueiredo , Director of the Faculty of Arts and Humanities, UC José Oliveira Martins , Co-chair Música Analítica, Director of the Centre for Interdisciplinary Studies, UC	
10H	KEYNOTE SPEAKER MODERATOR: Richard Cohn , Yale U. Nori Jacoby , Max Planck Institute for Empirical Aesthetics Around the world in 30 beats: Universal constraints on rhythm revealed by large-scale cross-cultural comparisons of rhythm priors.	
11H	COFFEE BREAK	
	ANFITEATRO III	SALA TP2
11H30	<i>Irreversibility and Process</i> CHAIR: Paulo Ferreira de Castro , NOVA U. Antonio Grande , "G. Verdi" C. of Music Assemblage, emergence and coding as new musical parameters.	<i>Empirical Approaches</i> CHAIR: Jessica Grahn , Western U. Laurel Trainor , McMaster U. The critical role of rhythm in infants' perceptual, communicative and social development.
12H	José Beato , U. of Coimbra The Listening of the Irreversible: Musicology and Metaphysics of Time in Vladimir Jankélévitch.	Ligia Silva , U. of Coimbra The Influence of Tonality, Musical Tempo and Individual Level of Musical Sophistication on Listeners' Estimates of Musical Duration.
12H30	Barak Schossberger and Yoel Greenberg , Hebrew U. A Synchronic Blind Spot: The Medial Moment and the Binary- Ternary Transformation of Sonata Form.	Tomas Lenc , U. Catholique de Louvain From sound to periodic beat: using electrophysiology to capture internal representation of musical rhythm.
13H	LUNCH	

October 12 programme continues next page

TIME	THURSDAY, OCTOBER 12	
	ANFITEATRO III	SALA TP2
15H	<i>Repetition and Variation</i> CHAIR: Benedict Taylor , U. Edinburgh Katherine Walker , Hobart and William Smith Colleges "Out of the Narrow Bonds" of Time: Reframing Haydn's Monothematic Sonata Forms.	<i>Polyrhythm and Syncopation</i> CHAIR: Anne Danielsen , U. Oslo Nicole Biamonte , McGill U. Clave-Family Rhythms in Popular Music.
15H30	Tian-Yan Feng , U. of Edinburgh Temporality, Philosophical Time, and Compositional Approach in Igor Stravinsky's Works: The Case of Symphony in C.	Ève Poudrier , U. of British Columbia Polyrhythm classification using the composite tool.
16H	Anne Hyland , U. of Manchester The Temporality of Variation and its Progressivization in Schubert's Early Music.	*Scott Murphy , U. of Kansas Duplex Syncopation Classes and Spaces, and Their Application to Western Popular Song.
16H30	Daniel Moreira , U. of Coimbra "Films are like music": repetition as a marker of musicality in David Lynch's screen work.	
17H	COFFEE BREAK	
17H30	PLENARY SESSION Avenues of Research on Musical Time Richard Cohn , Yale U. Anne Danielsen , U. Oslo Dean Rickles , U. of Sydney Benedict Taylor , U. of Edinburgh	
19H	RECEPTION (open to all registered participants) PAPA Restaurante, R. Alexandre Herculano 37, 3000-019 Coimbra	

* Remote session

TIME	FRIDAY, OCTOBER 13	
	ANFITEATRO III	SALA TP2
9H30	<i>Free Rhythm and Microtiming</i> CHAIR: Rainer Polak , U. Oslo Nariá Ribeiro , NOVA U. Exploring the rhythmic antinomy beat-based /non beat-based in Xenakis' Jonchaies.	<i>Musical, Historical and Mythological Time</i> CHAIR: Roger Matthew Grant , Wesleyan U. Leonor Losa , U. of Coimbra Fado expressiveness and the performance of time experience.
10H	Juliano Abramovay , Durham University and Codarts - U. for the Arts <i>Free rhythm and Taksim improvisation: case study of Oud players.</i>	Catello Gallotti , Conservatorio di Salerno <i>Conflicting Temporalities and Expressive Trajectory in Schumann's Widmung, op. 25/1.</i>
10H30	Martin Clayton and Sayumi Kamata , Durham U. <i>Metre and free rhythm in gagaku music.</i>	Nicholas Phillips , Oxford Brookes U. <i>Bridging cultural time zones: the treatment of time in Mascagni's Cavalleria rusticana.</i>
11H	Filippo Bonini Baraldi , NOVA U. <i>Analysis of Expressive Timing Microvariations in Oral Tradition Music: Two Studies from Romania and Brazil.</i>	Konstantin Zenkin , Tchaikovsky Moscow C. <i>The Forms of Mythological Time in Music and Musical Drama.</i>
11H30	COFFEE BREAK	
12H	KEYNOTE SPEAKER MODERATOR: José Oliveira Martins , U. of Coimbra José Luis Besada , Universidad Complutense de Madrid <i>Composers shaping time: a singular window for cognitive science.</i>	
13H	LUNCH	
15H	<i>Tempo and Small Gestures</i> CHAIR: Amílcar Cardoso , U. Coimbra David Code , Western Michigan U. <i>Sonifying Anisochronal Beats and Grooves.</i>	<i>Music and Poetry</i> CHAIR: Phillippa Ovenden , PIMS, U. of Toronto Jacob Reed , U. of Chicago <i>Meter and Accent Between Phonology and Music Theory.</i>
15H30	Nuno Trocado , U. of Coimbra <i>"Cramming": lived time in Charlie Parker's rhythmic phrasing.</i>	Filipe Rocha, Pauxy Gentil-Nunes and Liduino Pitombeira , U. Federal do Rio de Janeiro <i>Rhythmic-prosodic system based on rhythmic profiles: theory and tools for musical analysis and composition.</i>
16H	*Benjamin Lee and Guerino Mazzola , U. of Minnesota <i>Modeling Rubato as Cubic Spline Modifications of Symbolic Onset and Offset.</i>	Marina Mezzina , Royal Northern College of Music <i>The Moment, the Memories: how 'Poetic Temporality' Shapes Musical Structure.</i>
16H30	*Eshantha Peiris , U. of British Columbia <i>Timbral Cyclicity in the Performance of Sinhala Poetry.</i>	
17H	COFFEE BREAK	

* Remote session

October 13 programme continues next page

17H	COFFEE BREAK
17H30	KEYNOTE SPEAKER MODERATOR: Richard Cohn , Yale U. *Tosca Lynch , FRSA – eMousike.com 'Shaping the flow': ancient Greek rhythm and the movement of the voice
18H30	PLENARY SESSION Avenues of Research on Musical Time Jessica Grahn , Western U. Michelle Phillips , Royal Northern College of Music Martin Clayton , Durham U.
20H	DINNER (pre-registration required) Sapientia Hotel restaurant, Rua José Falcão 4, Coimbra

* Remote session

SATURDAY, OCTOBER 14		
TIME	ANFITEATRO III	SALA TP2
9H30	<i>Multi-temporality, Complexity and Paradox</i> CHAIR: Leonor Losa , U. Coimbra Elena Rovenko , Strasbourg U. "La peur de la symétrie": Irregularity of Artistic Time in French Music and Visual Art of the Fin de Siècle Era.	<i>Performance</i> CHAIR: Michelle Phillips , Royal Northern College of Music Dalila Teixeira , U of Coimbra Beyond eternity: performative direction and neo-narrative in Messiaen's Quatuor pour la fin du Temps.
10H	Nathan Martin , U. of Michigan Some Paradoxes of Musical Temporality	Carlota Martínez Escamilla , U. Complutense de Madrid In the Quest for Variety: Analysis of Performances of the Prelude from Bach's Cello Suite no. 4, BWV 1011.
10H30	Georgina Born , U. College London Time and Musical Genre.	Erica Bisesi and Sylvain Caron , U. of Montreal What does the perception of the optimal tempo depend on? A study on the role of musical expression.
11H	COFFEE BREAK	
11H30	<i>Cross-parameter, cross-dimensional, cross-modal</i> CHAIR: Daniel Moreira , I.P. Porto Vasilis Kallis , U. of Nicosia Musical Temporality – Reflections on the Implication of Secondary Musical Parameters.	<i>Cognition</i> CHAIR: Tomas Lenc , U. Catholique Louvain Riccardo Wanke , NOVA U. The spectrotemporal potential of sound-based music: a morphodynamical connection to the world.
12H	Marc Vidal and Nádía Moura , Ghent U. Relationships of prediction and alignment between musicians' movement and rhythmical and tonal contexts of music.	Rainer Polak , U. of Oslo Cultural plasticity of cognitive constraints on rhythm perception in listeners from Mali: An interdisciplinary approach.
12H30	Jason Yust , Boston U. Windows into Musical Time.	*Juan Chattah , U. of Miami Film Music's Metrical Affordances: Entrainment to Interpretation.
13H	LUNCH	
15H	PLENARY CLOSING SESSION MODERATOR: Richard Cohn , Yale U. Anne Danielsen , U. Oslo Dean Rickles , U. of Sydney Benedict Taylor , U. of Edinburgh Jessica Grahn , Western U. Michelle Phillips , Royal Northern College of Music Martin Clayton , Durham U.	
17H	CONFERENCE CLOSING	

* Remote session

Organizing/ Programme Committee

Ana Llorens, (Corpus Analysis and Performance) Universidad Complutense de Madrid

Ana Llorens holds a PhD in Music from the University of Cambridge. She is Lecturer in Music Theory and Analysis at the Universidad Complutense de Madrid and the scientific director of the ERC 'DIDONE' project. She specialises in the analysis of large corpora and, since 2019, board member of the Spanish Society of Musicology. Currently, she is Principal Investigator of the project 'The Sound of Pau Casals', funded by Spain's Ministry of Science and Innovation, as well as co-editor of the volume *The Cambridge Companion to Music in Spain* (CUP, forthcoming). Her work has been published in *Music Theory Online*, *Empirical Musicology Review*, Routledge, and Brepols.

Daniel Moreira, (Composition and Film) Centre for Interdisciplinary Studies (CEIS20) of the University of Coimbra and Porto Polytechnic Institute

Daniel Moreira is a composer and music theorist, as well as an assistant professor of musical analysis, composition and aesthetics at ESMAE — Politécnico do Porto and an integrated researcher of CEIS20 — Universidade de Coimbra. He holds a PhD in Music Composition (King's College London, 2017) and a MA in Music Theory and Composition (ESMAE, 2010). As a theorist, his work centers on issues of harmony and temporality in twentieth- and twenty-first-century music, with a special attention to film music and the comparative analysis of music and cinema. Part of this research is published in *Journal of Film Music* (2022) and *Music Analysis* (2021).

José Oliveira Martins, (Music Theory) Centre for Interdisciplinary Studies (CEIS20) of the University of Coimbra

José Oliveira Martins (Ph.D. University of Chicago, Music History and Theory) is Director of the Center for Interdisciplinary Studies (CEIS20) of the University of Coimbra, where he is a professor on the Faculty of Arts and Humanities (FLUC). He is the current president of the Portuguese Society for Music Research (SPIM) and co-founder of the European Network for Theory and Analysis of Music (EuroT&AM). Previous appointments include the Eastman School of Music of the University of Rochester and the University of Iowa. His work appears in the *Journal of Music Theory* (2016, 2023), *Journal of Experimental Research* (2023), *Perspectives of New Music* (2020), *Musurgia* (2019), *Portuguese Journal of Musicology* (2016), among others. His research interests explore the theoretical modeling of multilayered music in the 20th and 21st centuries, the experience and plasticity of time and musical discourse, the oral tradition of *Canção de Coimbra*, and the epistemology of interdisciplinarity.

Philippa Ovenden, (History and Notation) Pontifical Institute of Mediaeval Studies, University of Toronto

Philippa Ovenden (PhD Yale University, 2021) is Andrew W. Mellon Fellow at the Pontifical Institute of Mediaeval Studies, University of Toronto. Her work considers musical time in the Middle Ages from the perspectives of intellectual history and performance studies, with a particular focus on the visual representation of music in diagrams and notations. Her research has been published or is forthcoming in the journals *Early Music History*, *The Journal of Musicology* and *Music Theory Online*. She was the 2022–2023 Jean-François Malle Fellow at Villa I Tatti, The Harvard University Center for Italian Renaissance Studies and was previously a lecturer at the Massachusetts Institute of Technology.

Rainer Polak, (Music and Dance) RITMO Centre for Interdisciplinary Studies in Rhythm, University of Oslo

Rainer Polak is a researcher specializing in percussion music and dance from West Africa. At the RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion, he leads a multidisciplinary project on multi-modal rhythm perception and production in djembe music and dance from Mali. During the spring 2023 term, he served as the Benedict Distinguished Visiting Professor of Music at Carleton College. Previously, Polak was a researcher at the Max Planck Institute for Empirical Aesthetics (2017–2022) and the Hochschule für Musik und Tanz Köln (2011–2016).

Richard Cohn, (Music Theory) Yale University

Richard Cohn is Battell Professor of Music Theory at Yale University. He is author of a 2012 book on chromatic harmony, *Audacious Euphony*, and of a forthcoming book from MIT Press, *Mathematical Models of Musical Pitch and Time*. He has completed an initial draft of a book, *An Analytical Model of Musical Meter*. He serves as Executive Editor of *Journal of Music Theory*, and was founding editor of Oxford University Press's *Studies in Music Theory*.

Tomas Lenc, (Cognitive Neuroscience) Université Catholique de Louvain

Tomas Lenc is a postdoctoral research fellow at the Rhythm and Brains lab (IONS, UCLouvain, Belgium). During his PhD at the MARCS Institute for Brain, Behaviour and Development (Western Sydney University, Australia) he used electroencephalography (EEG) and behavioral methods to clarify the nature of processes that support perception and sensory-motor synchronization with musical rhythm. Currently, he continues to follow this line of research, aiming to map the functional network of brain regions involved in musical beat processing. He is generally interested in how the brain makes sense of musical rhythm by transforming rhythmic sensory features into behaviorally-relevant internal categories.

Arrangements Committee

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Chris Stover, Griffiths University
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Tomas Lenc, UC Louvain

Tosca Lynch, FRSA – eMousike.com



José Luís Besada

Universidad Complutense de Madrid

Composers shaping time: a singular window for cognitive science

Since the Romantic period, the imperatives of novelty and individual expression have been among the most salient features shaping the western art music tradition. This ideological perspective has pushed a great number of composers of the 20th- and 21st-centuries to devise personal conceptions of many musical features and parameters for developing their creative practices. The traces of these practices—mainly found in their sketches but also through further sources catching their reflection—can become a singular window for better grasping musical creativity from a cognitive point of view. In addition, a focus on musical conceptions of time may nurture, broadly speaking, cognitive science with particular case studies of highly creative people artistically dealing with this concept, which is also pivotal for managing our daily lives.

My talk will take the work and reflections of several composers, namely Iannis Xenakis (1922-2001), Pierre Boulez (1925-2016), Gérard Grisey (1946-1998), Kaija Saariaho (1952-2023), and Alberto Posadas (b. 1967). I will resort to several elements borrowed from cognitive linguistics and general psychology in order to discuss the cross-modal correspondences which are found in several of their time conceptualizations, as well as the cognitive mechanisms explaining the use and manipulation of some of their geometrical representations of time.

JOSÉ LUÍS BESADA

Following two post-doctoral periods at IRCAM and at the University of Strasbourg, José L. Besada is currently a mid-term research fellow at the Complutense University of Madrid. His research focuses on the formal, technological, and cognitive features of both contemporary musical practices and music theory. Some of his works have been published in leading music journals such as *Perspectives of New Music*, *Tempo*, *Organised Sound*, *Music Analysis*, and *Music Theory Online*. He has been twice guest co-editor of special issues for *Contemporary Music Review* and is the editor of the arts section of the *Journal of Mathematics and Music*. He is a founding member of the Sociedad de Análisis y Teoría Musical (SATMUS) in Spain, and the editor-in-chief of its journal, entitled *Súmula*.

Nori Jacoby

Max Planck Institute for Empirical Aesthetics

Around the world in 30 beats: Universal constraints on rhythm revealed by large-scale cross-cultural comparisons of rhythm priors.

Music is present in every known society, yet varies from place to place. What, if anything, is universal to music cognition? We measured a signature of mental representations of rhythm in 39 participant groups in 15 countries, spanning urban societies and indigenous populations. Listeners reproduced random “seed” rhythms; their reproductions were fed back as the stimulus (as in the game of “telephone”), such that their biases (the Bayesian prior) could be estimated from the distribution of reproductions. Every tested group showed a sparse prior with peaks at integer ratio rhythms. However, the importance of different integer ratios varied across groups, often reflecting local musical practices. Our results suggest a universal feature of music cognition – discrete rhythm “categories” at small integer ratios. These discrete representations likely stabilize musical systems in the face of cultural transmission, but interact with culture-specific traditions to yield diversity evident when perception is probed at a global scale.

NORI JACOBY

My research focuses on the internal representations that support and shape our sensory and cognitive abilities, and on how those representations are themselves determined by both nature and nurture. I address these classic issues with new tools, both by applying machine learning techniques to behavioral experiments, and by expanding the scale and scope of experimental research via massive online experiments and field-work in locations around the globe. I am a Research Group Leader at the Max Planck Institute for Empirical Aesthetics in Frankfurt, where I direct the “Computational Auditory Perception” group, and am incoming assistant professor in the Department of Psychology at Cornell University (starting in Fall 2024). Previously, I was a Presidential Scholar in Society and Neuroscience at Columbia University, and a postdoc at Josh McDermott’s Computational Audition Lab at MIT and at Tom Griffiths’s Computational Cognitive Science Lab at UC Berkeley. I completed my Ph.D. at the Edmond and Lily Safra Center for Brain Sciences (ELSC) at the Hebrew University of Jerusalem under the supervision of Naftali Tishby and Merav Ahissar, and hold a B.Sc. in Mathematics and Physics and an M.A. in mathematics from the same institution.

Tosca Lynch

FRSA – eMousike.com

‘Shaping the flow’: ancient Greek rhythm and the movement of the voice

This talk will explore the Greek notion of ‘rhythm’ (rhythmos, literally ‘flow’) as the dynamic ‘shape’ that organises the coordinated ‘movements of the voice’, i.e. melodies, and those of the body, i.e. dance steps (Pl. Leg. 2.664e–673a). We will start by looking at the origins of the Greek concept of rhythmos and its relationship to the Greek notion of ‘metre’ (metron)—concepts that, as we shall see, were very different from what is known as ‘metre’ and ‘rhythm’ in modern musicology.

We will then examine the main features of the ‘science of rhythm’ (rhythmikē) developed by Aristoxenus of Tarentum, paying special attention to the unit of measurement he created—the ‘primary duration’ (prōtos chronos)—and its theoretical implications. We will subsequently look at the key aesthetic role played by different types of ‘rhythmical feet’ (podes), their distinctive components (arsis and thesis), and the emotional impact of rhythms that differed in structure (taxis/schēma) and tempo/direction (agōgē). These theoretical features will be illustrated by means of practical examples preserved in the extant Greek musical documents, including a tragic lament from Euripides’ *Orestes* (DAGM 3) and the Seikilos song (DAGM 23).

TOSCA LYNCH

Tosca A.C. Lynch (PhD, University of St Andrews) has been Junior Research Fellow in Classics at Jesus College, Oxford, Visiting Professor at the University of Verona, and Research Associate at Oxford. Prior to her training in philosophy and classics, she earned a performer’s diploma in classical piano. Her research interests include technical and performative aspects of ancient rhythmic and harmonics, as well as the broader cultural and philosophical significance of mousikē in the ancient world. The interplay of these perspectives informs most of her publications. In addition to discussions of Plato’s philosophical use of musical concepts (*Greek and Roman Musical Studies*, 2017, 2020), she has recently advanced new reconstructions of the ancient perception of rhythm and meter (arsis and thesis, *Classical Quarterly* 2016; ‘Rhythmics’, *Blackwell Companion to Greek and Roman Music*, 2020), as well as the harmonic modulations introduced by the so-called New Music and their relationship to the extant musical documents (*Greek and Roman Musical Studies*, 2018, 2022a, 2022b). In 2022, Tosca launched a new website—www.eMousike.com—that presents new research evidence from a digital humanities perspective, including interactive 3D models of ancient instruments and the dDAGM App (database Documents of Ancient Greek Music).



**Música
Analítica
2023**

**Plenary
Speakers**

Anne Danielsen

RITMO, University of Oslo

Beat bins, asynchronies and muddy sounds: Shaping micro-time in grooves

KEYWORDS microrhythm; groove; timing; beat bins

In musical genres such as neo-soul and hip-hop, beats often have a temporal shape that makes their placement in time difficult to locate relative to a single point in time. This is often due to «muddy», processed sounds or asynchronies between events at beat-related metric positions. The beat bin theory suggests that the perceptual counterpart to such beat asynchronies or muddy beat shapes in a sounding groove is an internal (perceptual) reference structure of beat bins of considerable 'width' and a distinctive 'shape'. I will start by presenting the theory and then focus on how various acoustic factors influence the beat bin, using examples from computer-based musical grooves. Ultimately, I argue that micro-level perception of, and synchronization to, sound is optimized for the task at hand, in line with the flexibility and dynamic nature of the human apparatus in perceiving, predicting, and processing rhythm.

ANNE DANIELSEN

Anne Danielsen is Professor of Musicology and Deputy Director of RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion at the University of Oslo, Norway. She has published widely on theoretical, aesthetic, cultural and perceptual aspects of rhythm, groove and technology in postwar African-American popular music and is author of *Presence and Pleasure: The Funk Grooves of James Brown and Parliament* (2006) and *Digital Signatures: The Impact of Digitization on Popular Music Sound* (with Ragnhild Brøvig-Hanssen, 2016), and editor of *Musical Rhythm in the Age of Digital Reproduction* (2010/2016).

Benedict Taylor

University of Edinburgh

Music, Theories of Time, and Interpretation

KEYWORDS Cultural differences in temporal sensibility, 'temporality of nationalism', fiction of the present, Grieg

This paper thematises the diverse cultural understandings of time and the possibility for musical temporality to appear to reflect or offer aesthetic analogues for such conceptions. The centrepiece is an analytical vignette devoted to one of Edvard Grieg's *Slåtter* Op. 72, whose temporal characteristics – a build up to a long-heralded climax that never properly arrives – curiously parallel a statement by the composer from the same years relating to national self realisation.

BENEDICT TAYLOR

Benedict Taylor is Reader at the Reid School of Music, University of Edinburgh. Rooted in detailed analytical engagement with music, his work nonetheless seeks to explore the intersection between technical analysis and wider questions of meaning (cultural, historical, and especially philosophical). Publications include *Mendelssohn, Time and Memory: The Romantic Conception of Cyclic Form* (Cambridge, 2011), *The Melody of Time: Music and Temporality in the Romantic Era* (Oxford, 2016), and *Music, Subjectivity, and Schumann* (Cambridge, 2022). He is co-editor of *Music & Letters* and general editor of Cambridge University Press's *Music in Context* series.

Dean Rickles

University of Sydney

Music, Immortality, and the Soul

KEYWORDS Temporal art; Atemporality; Symmetry Breaking; Immortality; Gnosticism

The great Viennese musicologist, Viktor Zuckerkandl, once wrote that “[M]usic is the temporal art *par excellence*”. In one sense this is of course quite true. Indeed, Goethe famously described architecture (at least that of the cathedral builders) as “frozen music,” implying that music itself is essentially *unfrozen* or dynamical. Of course, one of the most basic elements of musical structure is its meter, that expresses, in this case, a temporal invariance that is neurophysiologically bound up with time processing and temporal phenomenology. What could be more obvious than this we might ask? Yet, at the same time, and as this paper will discuss, music is the *atemporal art par excellence*. We discuss how we can draw deep analogies between ideas about the nature of the soul, its immortality (timelessness), and the power of music to link the material to the immaterial.

DEAN RICKLES

Dean Rickles is Professor of History and Philosophy of Modern Physics at the University of Sydney, where he also is a director of the Sydney Centre for Time. Recent books include *Covered in Deep Mist: The Development of Quantum Gravity, 1916-1956* (Oxford University Press, 2020), *Life is Short: An Appropriately Brief Guide to Making it More Meaningful* (Princeton University Press, 2022) and *Dual-Aspect Monism and the Deep Structure of Meaning* (co-authored with Harald Atmanspacher, Routledge, 2022).

Jessica Grahn

Western University

Causal investigations of motor areas in rhythm and timing perception using transcranial direct current stimulation**KEYWORDS** rhythm; brain; timing; motor system.

Rhythmic temporal sequences can be represented relative to a beat (beat-based or relative timing), or as a series of absolute durations (non-beat-based or absolute timing). Neuroimaging work suggests involvement of the basal ganglia, supplementary motor area (SMA), the premotor cortices, and the cerebellum in both beat- and non-beat-based timing. Here we examined how discrimination of beat-based and non-beat-based sequences were affected by modulating excitability of the supplementary motor area, the right cerebellum, or dorsal premotor cortices, using transcranial direct current stimulation (tDCS).

JESSICA GRAHN

Jessica Grahn is a Professor of Psychology and Neuroscience at Western University. She investigates how the brain's motor system is involved in our perception of rhythm. Dr. Grahn received degrees in Neuroscience and Piano Performance from Northwestern University and her PhD from Cambridge University. She is a member of the Royal Society of Canada College of New Scholars and past President of the Society for Music Perception and Cognition. She has received awards for her science and outreach from NSERC (Steacie Fellowship) and CIHR (New Investigator Award) funding councils, Ontario government, and the British Science Association.

Martin Clayton

Durham University

Theory, empiricism and ethnographic research in musical rhythm

In this paper I will argue for the continuing need to integrate empirical and scientific research on rhythm production and perception with ethnographic research, which opens a window on culturally shared knowledge which may be inaccessible through any other means.

MARTIN CLAYTON

Martin Clayton is Professor in Ethnomusicology at Durham University. He studied at the School of Oriental and African Studies (SOAS) in London, where he obtained degrees in Music and Hindi (BA, 1988) and Ethnomusicology (PhD, 1993). His research interests include Hindustani (North Indian) classical music, rhythmic analysis, musical entrainment and embodiment.

Professor Clayton leads a strand of the EU-funded project EnTimeMent. He directed a major research project, 'Interpersonal Entrainment in Music Performance', funded by the Arts and Humanities Research Council (AHRC, 2016-18), and previously directed the 'Experience and meaning in music performance' research project: the co-authored book of the same name was published by OUP in October 2013. He was also co-investigator on Laura Leante's AHRC-funded project 'Khyal: Music and Imagination' in 2016.

Martin is a former editor of the *British Journal of Ethnomusicology*, and served for many years as committee member for the *British Forum for Ethnomusicology* (BFE) and the *European Seminar in Ethnomusicology* (ESEM). He was a member of the Music sub-panel for the 2008 Research Assessment Exercise, and for the 2014 Research Excellence Framework.

Michelle Phillips

Royal Northern College of Music

Modelling the Unmodellable? The complexities of experience of duration during music listening**KEYWORDS** LEMI model; Music and time; Elapsed duration

Experimental research has suggested that multiple complex factors influence the perception of duration when listening to music. These factors may relate to the personal characteristics of the listener (age, musical experience), musical characteristics (tempo, volume), environmental aspects (whether the music is live or recorded), or may result from an interaction of these (for example, a listener's prior music experience interacting with the musical material, leading to a sense of familiarity). Whilst empirical work to date has shed light on some of the ways in which music warps our sense of time, there is much still to be explored. Such investigation is made all the more challenging by other considerations when measuring experience of duration – paradigm (prospective, retrospective, passage of time judgements), method (verbal estimation, reproduction, comparison), and duration concerned (from milliseconds to multiple minutes), for example. Will we ever be able to model this complex experience?

MICHELLE PHILLIPS

Dr Michelle Phillips is a Senior Lecturer in Music Psychology at the Royal Northern College of Music. Her research interests include audience response to live and recorded music, neurological response to music listening and performance, music and time, perception of contemporary music, entrepreneurship, and music and Parkinson's. Recent publications include a co-edited volume published by Boydell & Brewer in 2022 entitled 'Music and Time: Psychology, Philosophy, Practice', Michelle's research on 'what makes live music special?' was recently featured in UK Research and Innovation's series '101 jobs that change the world'.

@__Michelle__

Richard Cohn

Yale University

Historicizing Non-Isochrony**KEYWORDS** Meter, poetics, Augustine, Arabic music theory, rhythmic cycles

Music theorists (London, Grant, Hudson) have recently proposed that rhythmic cycles are a species of musical meter even when their interonset intervals are not categorically uniform. This paper positions this proposal with respect to a long history of theorizing about poetic and musical time. The relation of non-isochronous rhythms to isochronous pulses was of concern with respect to Greek poetic theory of verse feet, Aristoxenus's theory of *chronos protos*, Augustine's identification of the dual syllable/*mora* relation, the application of this distinction to instrumental music by medieval Arabic theorists of rhythmic modes, Augustinian revival of 16th-century theorist Francisco de Salinas, and the 18th-century *metrum/Takt* distinction. In modern theories, a related duality arises in Lerdahl & Jackendoff's distinction between grouping and meter, in the child-psychological work of Jeanne Bamberger, and in the two meanings of compás in Flamenco pedagogy. I hypothesize some mechanisms of historical transmission that thread these various instances together.

RICHARD COHN

Richard Cohn is Battell Professor of Music Theory at Yale University. He is author of a 2012 book on chromatic harmony, *Audacious Euphony*, and of a forthcoming book from MIT Press, *Mathematical Models of Musical Pitch and Time*. He has completed an initial draft of a book, *An Analytical Model of Musical Meter*. He serves as Executive Editor of *Journal of Music Theory*, and was founding editor of Oxford University Press's *Studies in Music Theory*.



**Regular
Speakers**

Anne Hyland

University of Manchester

The Temporality of Variation and its Progressivization in Schubert's Early Music

KEYWORDS Schubert's early string quartets; Variation form and variation impulse; Lyric time versus progressive time (Monelle 2000); The temporality of cadential closure and its manipulation; Parataxis in music

The amalgamation of sonata and variation – two ostensibly opposing forms – is a fingerprint of Schubert's formal idiom giving rise to the co-existence of diverse temporal modes in his music. In the string quartets, the variation impulse, with its associated retrospective nature, often provides a viable alternative to the strictly linear and unidirectional demands of Classical first-movement sonata form, imbuing it with traces of what Raymond Monelle (2000) terms 'lyric time'.

This paper explores the inverse scenario: the ways by which Schubert progressivizes lyric time in his slow-movement variation forms. In other words, how he animates passages of lyric time via strategies of development and progression. It takes as its focus two early string-quartet slow movements (the D-major Quartet, D94/ii and the B-flat Quartet, D36/ii), the outward simplicity of which make them particularly resonant examples of Monelle's concept of lyric time, but whose inner workings disrupt and overturn that overarching aesthetic.

ANNE HYLAND

Anne Hyland is Senior Lecturer in Music Analysis at the University of Manchester and Associate Editor of *Music Analysis*. Her research interests include the analysis, reception history, and editing of nineteenth-century chamber music; theories of musical form and formal hybridity; music temporality and philosophy, and intersections between music historiography and analysis. Her work has appeared in five edited volumes on Schubert and in the journals *Music Analysis* (2009 and 2022), *Music Theory Spectrum* (2016) and *Music Theory and Analysis* (forthcoming). Her monograph, *Schubert's String Quartets: the Teleology of Lyric Form*, appeared with Cambridge University Press in April 2023.

Antonio Grande

"G. Verdi" Conservatory of Music, Como

Assemblage, Emergence and Coding as New Musical Concepts

KEYWORDS Assemblage; emergence; line of flight; relation of exteriority; deterritorialization

Recently, several new concepts have emerged that lead us to profoundly change the foundations of musical analysis. I'm referring to the recent philosophical debate, which aims to change the ontology of the musical work. Important insights can be drawn from the concept of assemblage by Deleuze and Guattari and the wide network of theoretical suggestions evoked by terms such as territory, deterritorialisation, lines of flights, and so on. Similar approaches can be found in a wider philosophical debate: I am thinking of concepts such as hyperobject (Morton), ANT (Latour), entanglement and intra-action (Barad), emergence, and so on.

Musical analysis, still strongly anchored in a structuralist framework, must deal with this body of ideas to stay connected to the contemporary debate. These themes are not new to a certain theoretical-analytical literature but are usually applied to the music of the 20th and 21st centuries. My aim is to explore whether this perspective can also be useful in the study of music of the past.

ANTONIO GRANDE

Antonio Grande is Professor of Analytical Subjects at the Conservatory of Como (Italy) and at the University of Calabria (Master in Analysis and Music Theory). He is currently editor-in-chief of *RATM (Rivista Italiana di Analisi e Teoria Musicale)*. His recent publications include: "Temporal Perspectives in Scriabin's Late Music" in V. Kallis – K. Smith, *Demystifying Scriabin*, Boydell & Brewer (UK) 2022, *Una rete di ascolti. Viaggio nell'universo musicale neo-riemanniano* (Aracne, Roma 2020), *Il moto e la quiete* (Aracne 2011).

Barak Schossberger and Yoel Greenberg

Hebrew University, Jerusalem

A Synchronic Blind Spot: The Medial Moment and the Binary-Ternary Transformation of Sonata Form

KEYWORDS Sonata form; Medial moment; Corpus study; Diachronic perspective; Hepokoski and Darcy's "defaults"

This paper explores the transition from binary form to classical sonata form, focusing on the "medial moment," the musical occurrence following the binary repeat sign. Departing from a traditional synchronic viewpoint, we claim that a diachronic perspective, which considers the passage of time and its impact on the evolution of musical elements, offers essential insights that a synchronic approach is blinded to. Relying on a corpus of over 200 works from 1740 to 1810, our study reveals a gradual shift in the medial moment's formal status through changes in key, location and thematic manipulation. Combining quantitative methods with close analysis, we argue that these changes qualitatively altered the roles and meanings assigned by composers to the medial moment. Furthermore, we propose an additional dimension to Hepokoski and Darcy's notion of "defaults," offering a time-sensitive context to the options that were available at any given point in time.

BARAK SCHOSSBERGER

Barak Schossberger is an Israeli violinist, violin teacher, and a postdoctoral fellow at the Hebrew University, Jerusalem. He holds degrees in violin performance from the Jerusalem Academy of Music and Dance, the Juilliard School and a DMA from the Eastman School of Music. Barak's research interests concern Schenkerian theory and the relation between performance and analysis. He presented his work at the SMA annual conference in Newcastle, UK, at the annual SMT Conference in New Orleans and in other conventions in the US and Canada. In addition to his academic research, Barak performs regularly as a chamber musician and teaches violin at the Jerusalem Conservatory Hassadna.

YOEL GREENBERG

Yoel Greenberg is associate professor of music theory at the Hebrew University of Jerusalem and violist with the Carmel Quartet. His main field of interest focuses on the study of evolution and change in eighteenth-century sonata form, using corpus studies alongside close analysis and history of theory. His book "How Sonata Forms" was published in 2022 by Oxford University Press, and he has published in numerous top journals on a variety of topics, including numerous prize-winning publications. Yoel is dedicated to public musical education, and presents the publicly and critically acclaimed explained concert series, "Strings and More".

Benjamin Lee and Guerino Mazzola

University of Minnesota - Twin Cities

Modeling Rubato as Cubic Spline Modifications of Symbolic Onset and Offset

KEYWORDS rubato; symbolic onset; cubic spline; retrograde; Honeradian retrograde

The classical software Rubato grants the freedom to be musically expressive via subjective modification of tempo, which is the transfer from symbolic to physical time parameters. These tempo modifications change physical onset and offset of each note.

At first glance, mathematically modeling musical rubato could be approached by specifying changes to tempo, but this strategy can lead to limitations when dealing with specific intervals of added silence between notes. Alternatively, rubato can also be generated by changes to the symbolic onset and offset of notes.

This symbolic onset-defined approach to mathematically defining rubato leads to new and additional conceptual and software benefits such as the categorization of retrograde as an “asymptotic tempo” form of rubato. This innovative conceptual approach, together with its software implementation, is described in our proposal.

BENJAMIN LEE

Benjamin Lee, an Honors undergraduate at the University of Minnesota, is pursuing a major in computer science and a minor in world music. His Honors Thesis centers around musical time and includes a software aiming to mathematically model and categorize rubato across musical genres.

GUERINO MAZZOLA

Guerino Mazzola earned his Ph.D. in Mathematics from Zurich University, where he also qualified as a professor in algebraic geometry with Peter Gabriel and in computational science with Peter Stucki.

Mazzola has profiled the European school of mathematical music theory since 1980 and has written six books on the subject, among them *The Topos of Music*, published by Birkhäuser, and proposed by the American Mathematical Society as the mathematics book of the year 2005. His French book, *La vérité du beau dans la musique*, is about the philosophy of music and was published in 2007 by Delatour. Mazzola’s approach to music includes sophisticated mathematics of topos theory, but also classical tools from group theory to homotopy theory.

Carlota Martínez Escamilla

Universidad Complutense de Madrid

In the Quest for Variety: Analysis of Performances of the Prelude from Bach’s Cello Suite no. 4, BWV 1011

KEYWORDS Performance Analysis; Sound recordings; J.S. Bach; Interpretative variety

Variety in music performance has been deemed a natural necessity on the part of practitioners (Godlovitch, 1988; Margulis, 2014; Smith, 1993). In fact, it has been noticed both in terms of performative patterns that vary throughout a given interpretation (Rink, Spiro, and Gold 2011) and across the multiple performances of a given piece (Fabian 2015; Fabian and Ornoy 2009; Llorens 2018; 2021b; Ornoy 2008). However, in most studies its discussion has been relegated to tangential commentaries, and very rarely has it been the focus of research. To fill this lacuna, this article investigates the interpretive techniques by which eighteen cellists create a sense of variety in a highly regular/non-changing musical context: the Prelude from J. S. Bach’s Suite for cello solo no. 4 in E flat major. The analysis addresses three main issues in each recording: a) the varying durational proportions between the various notes within each bar the patterns that emerge from it; b) the importance of dynamics in supporting, compensating, or even overruling the effect of a); and c) the relatively unstable.

CARLOTA MARTÍNEZ ESCAMILLA

Carlota Martínez Escamilla. Musicologist and cellist. She graduated in Musicology at the UCM in 2021, finishing with honors in the Final Degree Project and the award for the best academic record of the degree. During the academic year 2021/2022 she studied the Master in Spanish and Hispano-American Music at the same university. She is currently pursuing a PhD in Musicology with a predoctoral contract UCM. His academic interest in the analysis of the interpretation of sound recordings begins from the elaboration of the Final Degree Project and continues in the Master’s stage. At this moment, he is part of the working group of the i+D project “The sound of Pau Casals” with reference number PID2021-124445OA-I00.

Catello Gallotti

Conservatorio di Musica G. Martucci, Salerno

Conflicting Temporalities and Expressive Trajectory in Schumann's *Widmung*, op. 25/1

KEYWORDS Conceptual blending; Conceptual integration network (CIN); Structural analysis; Temporality; Motivic process

Schumann's song *Widmung*, Op. 25/1, is generally associated with the positive turning-point in his life around the 1840s. Indeed, both the text and the musical setting radiate a sense of a bright present. However, I demonstrate that a distressing figure – the chromatic motive F-Fb-Eb – pervades the song throughout. It first appears in section A1 as an inner-voice foreground motive, marking moments that fleetingly allude to past sorrows. Its respelled E-Eb dyad then migrates to the middleground bass underlying section B, to eventually be incorporated into the lament-like bass supporting the piano coda. Drawing on the cognitive principle of conceptual blending, I argue that the way this motive unfolds, running through different formal contexts, registers, and structural levels, engages the present/past temporal axis, thus suggesting an alternate scenario in which the present is an outward appearance in a persona whose past lurks in her/his psyche, casting unsettling shadows over the future.

CATELLO GALLOTTI

Catello Gallotti holds diplomas in pianoforte, polyphonic music and choral conducting. He is currently Professor of Theory of Harmony and Musical Analysis at the "G. Martucci" Conservatory of Salerno. His main research interests include classical *Formenlehre*, Schenkerian analysis, and history and pedagogy of counterpoint and harmony. He has served as vice-president of the Italian Gruppo Analisi e Teoria Musicale (GATM) and co-editor of the journal *Rivista di Analisi e Teoria Musicale* (RATM).

Dalila Teixeira

University of Coimbra

Beyond eternity: performative direction and neo-narrative in Messiaen's *Quatuor pour la fin du Temps*

KEYWORDS Messiaen's *Quartet pour la fin du Temps*; Directionality in performance; Sense of eternity; Narrative

Referring to his *Quatuor pour la fin du temps*, Messiaen noted that "we abandoned the past and present motion, through cycles and Destiny, to embrace eternity" (Messiaen in Rebecca Rischin, *For the End of Time*, 2003, p. 65). In this paper, I problematize the long analytical tradition which, after Messiaen, has often resorted to the notion of "eternity" to frame the temporal implications (of motionless) in this piece. My strategy is to question the experientially-detached ontological status (suggested by the concept) of "eternity" through the actual experience of the piece in performance, attending in particular to the sense of motion, direction, or narrative a performer might feel compelled to adopt in shaping (or in response to) several formal and textural musical elements.

For that I explore the notion of neo-narrative (Klein and Reyland, 2012), as an argument that reinforces the idea of the existence of a linear trajectory in the play and compromises the idea of eternity.

DALILA TEIXEIRA

She has a master's degree in artistic interpretation and her field of activity has two main activities: performance and research. In the artistic sphere, she often works with the *Caleidoscópico* Collective, which she founded in 2019, the *Contratempus* Quartet (2023), *Canto Nono* (2023) and the *Casa da Música* Educational Service (2019).

In the context of her research/performance, her academic training at ESMAE (bachelor's and master's degrees) and the University of Aveiro (master's degree in teaching) highlights professors Miguel Borges Coelho, Daniel Moreira, Pedro Burmester, Miguel Ribeiro Pereira and José Oliveira Martins. She is currently studying for a PhD in Artistic Studies at the University of Coimbra.

Daniel Moreira

ESMAE — Politécnico do Porto & Centre for Interdisciplinary Studies (CEIS20) of the University of Coimbra

“Films are like music”: repetition as a marker of musicality in David Lynch’s screen works

KEYWORDS temporality; repetition; musicality; cinema; David Lynch

According to Kulezic-Wilson (2015), music and cinema share three structural attributes — rhythm, movement, and time — all of which are of a temporal nature. This creates a potential of musicality for cinema that goes well beyond the use of music, as a film may emphasize rhythmic, kinetic or temporal elements, thereby displaying a strong sense of musicality.

One of the ways in which a musical sense of temporality can be suggested in a film is by foregrounding repetition in any of its stylistic elements (such as camera movement, editing, dialogue, sound effects and narrative structure). Since repetition is much more common in music than in other domains, “when we reinterpret another domain to emphasize its repetitiveness, we are, in fact, examining a quasi-musical aspect of that domain” (Margulis, 2014).

Drawing from this theoretical background, I explore salient instances of repetition in the sound design, dialogue and narrative structure of some of David Lynch’s screen works, discussing how different strategies of repetition make his films and series particularly musical.

DANIEL MOREIRA

Daniel Moreira is a composer and music theorist, as well as an assistant professor of musical analysis, composition and aesthetics at ESMAE — Politécnico do Porto and an integrated researcher of CEIS20 — Universidade de Coimbra. He holds a PhD in Music Composition (King’s College London, 2017) and a MA in Music Theory and Composition (ESMAE, 2010). As a theorist, his work centers on issues of harmony and temporality in twentieth- and twenty-first-century music, with a special attention to film music and the comparative analysis of music and cinema. Part of this research is published in *Journal of Film Music* (2022) and *Music Analysis* (2021).

David Løberg Code

Western Michigan University

Sonifying Anisochronal Beats and Grooves.

KEYWORDS metronome; non-isochronous; asymmetric; meter; microrhythm

Mechanical metronomes, unless they are broken, can only provide a flat, even pulse. There are, however, many musical genres which feature periodic, but asymmetrical beat patterns, such as Norwegian Springar, Balkan Aslak, and Mande dance music. Similarly, there are performance styles with expressive timing, swung rhythms and other non-isochronous microhythmic events. The web-based Asym metronome (<https://asym-co.de>) was designed for sonifying these types of anisochronal rhythmic patterns. In this presentation, I will demonstrate the functional features of Asym and present a variety of potential pedagogical and scholarly applications. This is intended to be an interactive session; attendees are encouraged to have their laptops or mobile devices available for use.

DAVID LØBERG CODE

Dr. David Løberg Code is a Professor of Music Technology and Theory at Western Michigan University (USA). He has been a Fulbright Scholar and visiting researcher at the University of Oslo and the Norwegian Network for Technology, Music and Art (NOTAM). Code’s research interests include alternative tuning and metric systems, live interactive performance with computers, musical cryptography, and interdisciplinary topics such as music and feminist pedagogy and world music. He is the founder and director of KLOrk, the Kalamazoo Laptop Orchestra, and developer of the Groven Piano, a 36-tone interactive piano network which received premieres in Norway and the Gilmore International Keyboard Festival (USA).

Elena Rovenko

Strasbourg University

“La peur de la symétrie”: Irregularity of Artistic Time in French Music and Visual Art of the Fin de Siècle Era

KEYWORDS symmetry; ornament; arabesque; la durée; the French fin de siècle art

This paper considers the phenomenon of the “fear of symmetry” in French fin de siècle music and painting as an indicator of gnoseological and creative strategies of working with the category of time (initially ontological) and the category of space derived from it. The historical lineage of French art is analysed, distinguished by the innovative understanding of time as a self-developing essence, intrinsically connected with the artistic matter. It paves the way to the 20th century by corresponding, on the one hand, with the Bergsonian philosophy of la durée, and on the other — with the nascent branch of art studies in the 1890s (A.Riegl) presupposing a “non self-identical” manifestation of artistic sense, characterised by the continuous increase in information. The aesthetic concepts and works by C. Debussy, P. Dukas, V. d’Indy, G. Moreau, M. Denis, O. Redon are cited as examples, which reveal overcoming the “fear of symmetry” through temporal irregularity, fixed in the phenomenon of the arabesque.

ELENA ROVENKO

Elena Rovenko, PhD, is a Russian researcher benefiting from the French Program “PAUSE” for Researchers in Exile, is working this year in the ACCRA laboratory (Strasbourg University). Until the war in Ukraine, she was a Senior Researcher and an Associated Professor (Moscow P.I. Tchaikovsky Conservatory). Author of 45 articles (on cinema, French music, philosophy, painting) and the monograph *Category of Time in Philosophical and Artistic Thinking*. H. Bergson, C. Debussy, O. Redon. Moscow, 2016. Participant of more than 80 international scientific conferences.

Erica Bisesi and Sylvain Caron

Music Faculty, Montreal University

What does the perception of the optimal tempo depend on? A study on the role of musical expression

KEYWORDS optimal tempo; music structure; music expression; interpretation styles; teaching music performance

Perceptual experiments on moving images suggested the existence of an “optimal” speed in image rendering. Our aim was to investigate whether such an effect does exist also in the musical domain. For a given musical piece, do listeners show a clear preference for a specific tempo, or do they define a range within which different tempi are acceptable? How can their preferences be correlated with the structural features of a piece – e.g., its phrasing, rhythm, and melodic/harmonic profiles? In which way the choice of an optimal tempo is affected by performance expressivity? Previous results confirmed the existence of a preferred tempo in listening to melodies, as well as of a tolerance range. We identified some general tendencies concerning the impact of rhythmic, melodic and harmonic structures. Our study is being extended by including expressive tempo variations: the optimal tempo is being modelled as a regression of the various elements featuring a given interpretative style – namely, average tempo, tempo variations, phrasing segmentation, and performed emphasis on salient events.

ERICA BISESI

Erica Bisesi’s academic background is multidisciplinary: PhD in Mathematics and Physics, MSc in Astrophysics, MA in Piano Interpretation and MMus in Music Theory and Analysis (in progress). She is adjunct professor at the Faculty of Music of the Montreal University, cofounder of the society for artistic production MASK APS, and postdoctoral researcher in astrobiology at the Astronomical Observatory of Trieste. She taught music cognition at the Universities of Graz and Bratislava, and acoustics and psychoacoustics at the Udine Conservatory, Italy. She directed or participated in several projects on computational musicology at the Center for Systematic Musicology in Graz, the KTH in Stockholm and the Institut Pasteur in Paris.

SYLVAIN CARON

Sylvain Caron has taught at the Faculty of Music since 1995. His teaching covers the history of baroque music, the musicology of performance, musical analysis and interpretation, and the relationship between music and the fine arts. He heads the GRIMAE (Groupe de recherche en Interprétation musicale, analyse

et expression) and is a member of the OICRM's French Music Team. His current research focuses on the notion of expressive accuracy in the sung voice, and on performance and expression in the works of François Couperin and in French *mélodie*. His research is funded by the OICRM and by a FRQSC team grant. He has been president of the Société québécoise de recherche en musique and editor of the *Cahiers de la SQRM*. He collaborates regularly with the Montreal Museum of Fine Arts in training guides (painting-music relations in exhibitions) and with the Arte Musica Foundation for public lectures. Sylvain Caron holds a doctorate in performance (symphonic organ) from the Université de Montréal's Faculty of Music, under the direction of Antoine Reboulot, and remains active as a performing organist.

Eshantha Peiris

Vancouver Community College

Timbral Cyclicality in the Performance of Sinhala Poetry

KEYWORDS cyclicality; timbre; poetry; drumming; South Asia

Around the world and over the centuries, many scholars have theorized musical rhythm in relation to poetic meter, driven by a variety of motivations and typically within circumscribed cultural contexts. While recognizing the limitations of using concepts of poetic patterning to understand music, I suggest that there are concepts of cyclic auditory phenomena—such as recurring timbres—shared between poetry and music that deserve further exploration in terms of their historical development and cognitive underpinnings. This paper treats historical Sinhala verse from Sri Lanka as a case study, examining how cyclicality can be perceived in sung poetry, both in the verbal timbres of poetic consonance and in the timbrally distinct strokes of the accompanying drumming.

ESHANTHA PEIRIS

A graduate of the University of British Columbia, Eshantha Peiris teaches history and analysis of a variety of musics at Vancouver Community College in Canada. He is co-chair of the Society of Ethnomusicology's South Asia Performing Arts section and managing editor of the journals *Analytical Approaches to World Musics* and *Analytical Approaches to Music of South Asia*.

Ève Poudrier

University of British Columbia

Polyrhythm Classification using the composite tool**KEYWORDS** rhythm perception; music analysis; empirical aesthetics; corpus studies; twentieth-century music

This paper proposes a definition of polyrhythm that affords classification of a wider variety of polyphonic textures along a set of characteristics derived from “composite rhythms,” i.e., the sequential presentation of event onsets reduced to a single strand. Examples of notated rhythmic polyphony from the Suter 1980 Corpus (<https://polyrhythm.humdrum.org/>) that have been encoded in kern for computational analysis using the composite tool (<https://doc.verovio.humdrum.org/filter/composite/>) are provided as case study. One of the advantages of this approach is that it allows for comparison across different types of ensembles, regardless of the number of instrumental parts. By dividing the polyphonic texture into contrasting rhythmic strands, aspects of metric orientation, rhythmic patterning, event density, coincidence, and salience can be assessed. It is argued that measures derived from composite rhythms not only afford more fine-grain characterization of rhythmic structures, but also provide an opportunity to address issues of perceived complexity using realistic musical stimuli.

ÈVE POUDRIER

I am an Assistant Professor in music theory at the School of Music of the University of British Columbia, where I teach courses on compositional practice in Europe in the 18th and 19th centuries, techniques of graphic linear analysis, and music psychology. My research has been presented at interdisciplinary conferences in North America, Europe, and the Middle East, and published in *Music Perception and Empirical Musicology Review*. My current projects focus on empirical aesthetics, specifically the experience of listening to rhythmic polyphony and the aesthetics of complexity, combining methods of close study, computer-aided musicology, and behavioural experimentation.

Filipe Rocha, Pauxy Gentil-Nunes and Liduino Pitombeira

Universidade Federal do Rio de Janeiro

Rhythmic-Prosodic System Based on Rhythmic Profiles: Theory and Tools for Musical Analysis and Composition**KEYWORDS** Rhythmic-Prosodic System; Rhythmic Profiles; Prosodic Functions; Musical Analysis; Musical Composition

In this study, we raise some characteristics of prosodic rhythm and rhythmic profiles to formalize a transformational rhythmic system based on the distribution of accents and specific prosodic functions. For this purpose, some concepts already consolidated in rhythm theories will be presented, and others coined during the elaboration of the system. The rhythmic profile in this study is composed of two or three elements with determined functions, called prosodic functions, one of which is necessarily accented (thesis) and the others unaccented (arsis, anacrusis, and duplum). Combining these functions and their expression culminates establishing structural levels and sublevels, resulting in a finite number of configurations. The exhaustive taxonomy of these results establishes a partially ordered set of 296 rhythmic profiles organized through inclusion relations (where each element can fit in its upper neighbor). We believe this vision can bring new applications to composition, analysis, and performance practices.

FILIFE ROCHA

Filipe de Matos Rocha, a Brazilian composer, educator, researcher, and music producer, leads the Pluggin production company. His focus spans African-American Music, Music Theory, and Music-Math connections. His compositions delve into Brazilian black culture, religious identity, and otherness. Filipe holds a doctorate in music from UFRJ and a Master's in Music Composition from the same institution. He completed his Bachelor's in Composition at UFRJ and studied Music Education at UNIRIO. Performances of his works, ranging from chamber music to orchestral pieces, resonate worldwide.

PAUXY GENTIL-NUNES

Composer and flutist. Master Degree in Composition and Doctor Degree in Musical Language and Structure. Professor of Harmony, Analysis and Composition in School of Music of Federal University of Rio de Janeiro. Works performed and recorded in Brazil and overseas. Coordinator of Post-Graduation Program in Music of Federal University of Rio de Janeiro from 2015 to 2019. Member of ABSTRAI Ensemble and PArtiMus Research Group.

LIDUINO PITOMBEIRA

Liduíno Pitombeira is a professor of composition at the School of Music of the Federal University of Rio de Janeiro (UFRJ), Brazil. He has published articles on music composition and theory in various academic journals in Brazil, and has also presented his research at conferences both in Brazil and internationally. Pitombeira is a member of MusMat, a research group associated with the Graduate Program in Music at UFRJ, dedicated to the exploration of studies and computer modeling at the intersection of music and mathematics, with applications in the realms of composition and musical analysis. His compositions have been performed by renowned ensembles such as The Berlin Philharmonic Wind Quintet and the São Paulo State Symphony Orchestra.

Filippo Bonini Baraldi

INET-md and FCSH, NOVA University

Analysis of Expressive Timing Microvariations in Oral Tradition Music: Two Studies from Romania and Brazil

KEYWORDS Author keywords; Music and emotion; microtiming; empirical ethnomusicology

In this paper I will present two studies on expressive timing microvariations in oral tradition music: one on rural string music from Transylvania (Romania) and one on carnival percussive music from Pernambuco (Brazil).

In the first case, we applied multi-track and motion capture technologies to measure the asynchronization between a violinist and a bracist (three-string viola player). In the second case, multi-track recordings and automatic onset detection algorithms allowed us to analyze the microdeviations in time (microtiming) in a group of five percussionists performing Maracatu de baque solto.

Based on the results obtained in both studies, I will advance a few considerations on the benefits and challenges of multimodal recordings and analysis of expressive microvariations in oral tradition music. In particular, I will argue that these research topics and methods, combined with long term field research, enable the highlighting of ensemble playing strategies that may differ subtly from those used by performers of the so-called written tradition of music.

FILIPPO BONINI BARALDI

Filippo Bonini Baraldi is researcher at the Instituto de Etnomusicologia (INET-md) of NOVA University, Lisbon (Portugal), where he leads the research group "Ethnomusicology and Popular Music Studies". In 2022, his book "Roma Music and Emotion", (2021, Oxford University Press) has been awarded an honourable mention by the ICTM and the William A. Douglas Prize in Europeanist Anthropology by the Society for the Anthropology of Europe.

Georgina Born

Institute of Advanced Studies, University College London

Time and Musical Genre

KEYWORDS time; musical genre; iteration; retention; protention

This presentation focuses on the relationship between time and musical genres. Its interdisciplinary points of reference are three-fold: theories of genre as they have developed between popular music studies and film and literary theories (Fabbri 2004, Negus 2013); the anthropology of time (Moon 1992, Gell 1998); and art historical accounts of time. In this light the paper probes the ways in which musical genres have complex relationships with time, conjoining multiple processes of change. On the one hand, genres' coalescence and life course are immanently processual, embodying particular temporalities and activating specific types of temporal experience. On the other hand, musical genres are produced by and within historical conditions that exhibit both continuity and change. While some of these temporal properties are registered in previous studies, the multiple ways in which time and musical genre are entangled have not yet been marshalled and thought together.

GEORGINA BORN

Georgina Born is Professor of Anthropology and Music, University College London. Previously she held Professorships at Oxford (2010-21) and Cambridge Universities (2006-10). Her work combines ethnographic and theoretical writings on music, sound, digital/media and interdisciplinarity. She recently published *Music and Digital Media: A Planetary Anthropology*, and is now editing *Music and Genre: New Directions* with David Brackett. She directed the ERC program 'Music, Digitization, Mediation' (2010-15) and in 2021 was awarded another ERC grant for 'Music and AI: Building Critical Interdisciplinary Studies'. She has held visiting professorships at UC Berkeley, UC Irvine and Aarhus, Oslo, McGill and Princeton Universities.

Jacob Reed

University of Chicago

Meter and Accent Between Phonology and Music Theory

KEYWORDS meter; accent; phonology; GTTM; prosody

Meter, rhythm, stress, accent, beat—tone, tune, melody, phrase...is this a paper on music theory or phonology? In this paper, I propose that this terminological overlap is neither a coincidence nor a simple metaphor, but rather diagnoses concepts and frameworks that are literally shared between the two fields. To substantiate this, I outline a dual history of recent American theories on (musical) rhythm and meter and (linguistic) meter and stress. I first show how Cooper and Meyer's prosodic theory of rhythm was adopted in Mark Liberman's work on intonational phonology. After reviewing how linguistic ideas like Liberman's were taken up in Lerdahl and Jackendoff's *Generative Theory of Tonal Music*, I then discuss the impact that Lerdahl and Jackendoff in turn had back in linguistics, particularly work on stress by Alan Prince and Bruce Hayes. Given that Prince redefined phonology with Optimality Theory (which drew on GTTM's theoretical framework), this history thus embraces two of the most significant postwar revolutions in both fields.

JACOB REED

Jacob Reed is an organist and PhD student in Music Theory and History at the University of Chicago. His dissertation project, "Negotiating Grammars: Encounters Between Music and Text" combines tools from music theory and phonology to examine how lyrics and music fight, replace, and compensate for each other; case studies include recent American pop music, indie rock, Chinese opera theory, and hip-hop. Other recent and ongoing projects have explored the interaction of music, language, and aesthetics in Early and Middle Period Chinese literary criticism, Romantic German music criticism and philosophy, jazz literature and criticism, and (with Chris Batterman Cháirez) the history of anthropology.

Jason Yust

Boston University

Windows into Musical Time**KEYWORDS** Windowed analysis; Vertical time; Scale degree qualia; Chord loops; Rhythmic cycles

The paradigm of windowed analysis can operationalize “vertical time” as involving varying window sizes around fixed points in a temporal sequence. This allows us to distinguish vertical and linear temporal properties of musical objects. I consider implications for the philosophy of musical time, scale degree qualia and key contexts in European functional harmony, Hindustani raga theory, popular music chord loops, and rhythmic progressions in West African drumming. Analytical applications use harmonic and rhythmic spaces derived from analyzing pitch-class sets and rhythms through periodic functions (Fourier transforms). Based on these examples I deconstruct Bergson’s critique of physicist’s time, splitting it into three distinct issues: linearity, infinite divisibility, and the Heisenberg uncertainty principle.

JASON YUST

Jason Yust is an Associate Professor of Music Theory at Boston University and the current co-Editor-in-Chief of the *Journal of Mathematics and Music*. His work deals with applications of mathematics to harmony, rhythm, and musical structure. His 2018 book, *Organized Time: Rhythm, Tonality, and Form*, was the winner of the Society for Music Theory’s 2019 Wallace Berry Award.

José Beato

University of Coimbra

The Listening of the Irreversible: Musicology and Metaphysics of Time in Vladimir Jankélévitch**KEYWORDS** Irreversibility; Metaphysics of time; Duration; Instant; Vladimir Jankélévitch

Jankélévitch seeks to think “sub specie durationis”, exploring time as the privileged object of his metaphysical inquiries and understanding it through the fluidity of becoming and the discontinuity of the instant. Within this framework, music emerges as a privileged domain for experiencing the temporality of time itself, through the transformative movement of sound forms that intersect cosmic time and lived time.

Music allows us to listen to the irreversible, which is the very essence of time. This becomes a central conceptual topic that interconnects musical experience, musicology, and the philosophy of time in Jankélévitch’s work, which includes stylistic analysis on specific musical composers, such as Debussy and Fauré.

One should consistently emphasize the centrality of musical perception and the associated pleasure. In doing so, one challenges the reduction of music to mathematical relations found in the Pythagorean-Platonic-Leibnizian tradition, which overvalues geometric proportions, ultimately projecting music into a spatial framework.

JOSÉ BEATO

José Beato is a researcher at the University of Coimbra (Portugal) and holds a Ph.D. in Philosophy. He is a member of the “Instituto de Estudos Filosóficos” and the “Centro de Estudos Clássicos e Humanísticos”. After working on the metaphysics and the phenomenology of feeling (Scheeler, Marcel, Ricoeur, Dufrenne, Henry, Barbaras), he has more recently undertaken research on the renewal of virtue ethics in both continental and anglo-american philosophy (Jankélévitch, Annas, Slotte). He also completed studies in vocal performance at the Coimbra Conservatory.

Juan Chattah

University of Miami

Film Music's Metrical Affordances: Entrainment to Interpretation

KEYWORDS film music; affordances; entrainment; embodied cognition

Film music often operates subliminally, engaging us at a pre-cognitive level to convey complex messages that motivate, support, highlight, complement, or even negate other facets of the cinematic experience. Here, I combine the notions of entrainment and affordances to construct an exploratory framework that sheds light on the narrative and expressive power of meter in film music. Applying this exploratory framework to scenes from a diverse repertoire of films reveals how the music's metrical structure makes us participants in the characters' actions while revealing their intentions—from collective motor coordination for social bonding to constructing individual and group identities grounded in cultural practices and values. More broadly, I argue that our evolutionary history plays a vital role in our cinematic experiences, and that understanding the underpinnings of embodied mechanisms may provide valuable insights into how our evolutionary history has shaped (and continues to shape) our emotional responses to temporal arts.

JUAN CHATTAH

Juan Chattah is Associate Professor of Music at the Frost School of Music, University of Miami, USA. His research delves into music's impact on cognitive capacities and explores musical multimedia through the lenses of semiotics and neuropsychology. In his forthcoming book, *Film Music: Cognition to Interpretation* (Routledge, 2023), he presents a holistic approach that navigates through the humanities and sciences to explore the dynamic counterpoint between a film's soundtrack, its visuals and narrative, and the audience's perception and construction of meaning, unveiling the thrilling interplay that breathes life into our cinematic experiences.

Juliano Abramovay

Durham University and Codarts - University for the Arts

Free rhythm and Taksim improvisation: case study of Oud players

KEYWORDS Free Rhythm; Taksim Improvisation; Rhythm Analysis; Makam Music

'Free rhythm' is defined as the rhythm of music lacking pulse-based periodic organization (Clayton, 1996). It is a topic that poses analytical challenges due to the absence of an existing metrical framework, typically essential for rhythmic analysis. This research proposes a methodology to analyze Taksim improvisation, a free rhythm practice from the Eastern Mediterranean region. We investigate Taksim improvisations performed on the Oud by observing data related to the regularity and periodicity of its phrases. This enables a comparison of rhythmic approaches among different musicians, allowing for a broader discussion related to how rhythm is employed within free-rhythm music. Preliminary findings indicate the possibility of identifying distinct rhythmic features within different styles of Taksim performances.

JULIANO ABRAMOVAY

Juliano Abramovay is a musician, educator, and researcher from Brazil. After studying classical guitar at São Paulo's Municipal School of Music and musicology at the University of São Paulo, Juliano delved into fretless guitar and oud, researching traditional music from Greece and Turkey. He obtained his masters at Codarts- University for the Arts before proceeding with a PhD research project at Durham University. Currently, Juliano is a teacher at Codarts, where he is actively involved with the Rotterdam Arts and Science Lab (RASL) and with research disciplines, and a Graduate Teaching Assistant at Durham University.

Katherine Walker

Hobart and William Smith Colleges

**“Out of the Narrow Bonds” of Time:
Reframing Haydn’s Monothematic Sonata Forms****KEYWORDS** Haydn; monothematic; Schiller; Sonata Form; Time

This essay offers an interpretive model of Haydn’s monothematic sonata forms that celebrates, rather than dismisses, tensions between generically prescribed forward motion, on the one hand, and repetition, unity, and return—aspects of the monothematic sonata forms that have traditionally been disparaged or dismissed—on the other. In engaging this second purpose, the essay interprets Haydn’s formal approach using the moral philosophy of Friedrich Schiller, who aestheticizes tensions between motion and stasis, progress and reminiscence, that resonate in Haydn’s monothematic sonata forms. The essay concludes with three case studies from Haydn’s quartet repertory—opus 64/6/i, opus 20/5/i, and opus 33/1/i—exhibiting three ways in which monothematicism can be seen to interrogate the generically prescribed temporality of sonata form.

KATHERINE WALKER

Katherine Walker is associate professor of music at Hobart and William Smith Colleges, in Geneva, NY. Her research interests include eighteenth-century musical aesthetics and intersections of race and popular music in the U.S. since 1920. Recent titles include “Leopold Mozart, the Rationalist? Humanism and Good Taste in Eighteenth-Century Performance Practice,” “Beyond Gods and Zombies: Apotheosis in Chopin’s Ballades,” and “Competitive Jamming in 1930s and 1940s Jazz.” Her current project is a book called, *Interpreting Music, Engaging Culture: Introduction to Music Criticism*, which is in contract with Routledge. Walker holds dual bachelor of arts degrees in music and psychology and advanced degrees in musicology.

Konstantin Zenkin

Tchaikovsky Moscow Conservatory

**The Forms of Mythological Time in
Music and Musical Drama****KEYWORDS** musical drama; synthesis of arts; concept of time; musical time; mythological time

The paper aims to indicate the roots of musical time in various forms of mythological thinking, for which purpose we suggest to consider musical time within the interdisciplinary context. Among the objectives is to reveal the implicit link of typical compositional structures in the European modern era music with the mythological prototypes; to demonstrate the ways of synthesis of mythological time concepts (cyclic time, “arrow finite time”, the frozen moment) and their projection on the explicit level in the musical drama of the 19th (Wagner) and the 20th century (B.A. Zimmermann, K. Stockhausen). Wagner stated the integrity of musical drama and myth as a necessary source of plots. Creating modern, Romantic myths, Wagner drew on the archaic mythology - both the pagan ancient-German one and Christian.

The philosophy of time and philosophy of music by Alexei Losev act as the methodological source (1927): according to Losev, time is the alogical becoming of number and music - the expression of numerical becoming, i.e., time.

KONSTANTIN ZENKIN

Konstantin Zenkin, born 1958, Moscow, Doctor of Art Research (1996), Professor of the Tchaikovsky Moscow Conservatory, since 2009 – also Vice-rector for research activities. Author of the books: *Chopin’s Piano Miniature* (1995), *Piano Miniature and Ways of Musical Romanticism* (1997; 2nd ed. - 2019), *Music – Eidos – Time. A.F. Losev and scope of contemporary discipline of music* (2015, in English transl. - 2018), and articles; read lectures as invited professor in the universities of Philadelphia, Hong Kong, Leuven, Belgrade etc. Chief-editor of the musicological magazines *Nauchny Vestnik Moskovskoy Konservatorii* (since 2010), *Music of Eurasia. Traditions and the Present* (since 2020).

Laurel Trainor

McMaster Institute for Music and the Mind, McMaster University

The critical role of rhythm in infants' perceptual, communicative and social development

KEYWORDS Development; Infant; Rhythm; Neural tracking; Social affiliation

Our experience of the world unfolds over time, and consequently, our perception, thoughts and actions are temporally organized. Sound events of music and speech occur in rapid sequences, and regularities in their temporal structures—i.e., rhythms—help us perceptually organize them into meaningful units such as melodic phrases or words in real time. Rhythms are also powerful in that their temporal regularities enable prediction about when important future events are expected, allowing optimal focusing of attention. Infants need to learn the musical and linguistic communication systems in their environment. An early ability to process rhythm and timing is likely a prerequisite for this. Indeed, the major developmental disorders, including dyslexia, language impairment, autism, attention deficits and developmental coordination disorder are associated with timing and rhythm deficits. Here we synthesize research on infants' early rhythmic abilities, from neural processing of rhythmic structure to the role of rhythm in early social interactions.

LAUREL TRAINOR

Laurel Trainor is Professor of Psychology, Neuroscience and Behaviour at McMaster University, a Fellow of the Royal Society of Canada, the Canadian Institute for Advanced Research, the Association for Psychological Science, and holds a Lifetime Achievement Award from the Society for Music Perception and Cognition. She directs the Auditory Development Lab (<https://trainorlab.mcmaster.ca/>), publishing over 160 articles including in *Science* and *Nature*. She Directs McMaster Institute for Music and Mind (MIMM), housing LIVElab (<https://livelab.mcmaster.ca/>), a unique research-concert hall for studying how performers and audiences interact, and music promotes health and well-being. Laurel is also principal flute, Burlington Symphony Orchestra.

Leonor Losa

Centre for Interdisciplinary Studies (CEIS20) of the University of Coimbra

Fado expressiveness and the performance of time experience

KEYWORDS fado; geographies of expressiveness; regimes of historicity; experiences of time; performance

The narratives involving the history of fado as a genre of national urban popular music have underlined different frameworks of identity representation carried out by the general historiography of the country. These frameworks are inscribed in the discourses around the “genesis” of fado, placing it either in an ancestral chronotope (Bakhtin, 1981) prior to the formation of the nation, in the period of Arab occupation of the Iberian Peninsula (between the 7th and 15th centuries), as part of a Mediterranean expressiveness; or in a modern chronotope, bearing an Atlantic genealogy, based on the culture of maritime contact on the Europe-Africa-America axis, taking place in a post-maritime expansion period (16th century onwards).

By elaborating the concept of “geographies of expressiveness”, this paper tries to show how the tension between these processes of identification is not only located in the histories of fado's production, but is also audible in the creative and expressive work of fado singers.

LEONOR LOSA

Leonor is a researcher in the domains of ethnomusicology and cultural studies of music at the Center for Interdisciplinary Studies – CEIS20 – at the University of Coimbra, where she coordinates the Research Group on Artistic Currents and Intellectual Movements. She is also Invited Professor at the Department of Artistic Studies at the Faculty of Letters at the same University; Member of the board of the Portuguese Society for Research in Music; general co-editor of the Portuguese Journal of Musicology (RPM); and member of the Coimbra Song Platform (University of Coimbra).

She is the author of the book *'Machinas Fallantes': Recorded Music in Portugal at the beginning of the 20th century* (Tinta da China, 2014).

Lígia Silva, Michelle Phillips and José Oliveira Martins

Faculty of Arts and Humanities; Centre for Interdisciplinary Studies (CEIS20), University of Coimbra

The Influence of Tonality, Musical Tempo and Individual Level of Musical Sophistication on Listeners' Estimates of Musical Duration

KEYWORDS musical tempo; duration estimation; time perception; tonality; musical sophistication

Music listening affects time perception. A number of studies suggest that musical, individual, conventional, and environmental factors may cause this influence. In the present study, two experiments investigated the effect of musical factors (tonality and tempo) and individual factors (listener's level of musical sophistication) on subjective estimates of duration. Participants estimated the duration of different versions of musical stimuli under retrospective and prospective conditions. Stimuli varied in tonality and tempo, while other musical parameters remained constant. Estimates were made using written estimates of minutes and seconds (Experiment 1) and reproducing the perceived duration (Experiment 2). Results showed no effect of tonality or musical sophistication on duration estimates. A faster tempo led to longer estimates, in the prospective condition, in Experiment 2. In conclusion, findings suggest that isolated changes in tonality and differences in musical sophistication do not affect estimates, and musical tempo changes may influence estimates under specific conditions.

LÍGIA SILVA

Lígia is currently a Ph.D. student in Art Studies at the University of Coimbra, studying the effects of music listening on time perception. Flutist and saxophonist, with extensive work as a music performer. Holds bachelor degrees in both classical and jazz music, and a master degree in music education. Received a merit grant from the University of Coimbra and a 3rd prize in the 3-min thesis competition. After over a decade of experience as a music teacher is now a full-time researcher at the Centre for Interdisciplinary Studies (CEIS20) under a grant from the Foundation for Science and Technology (FCT).

MICHELLE PHILLIPS

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JOSÉ OLIVEIRA MARTINS

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Marc Vidal and Nádia Moura

IPEM, Ghent University; Dept. of Statistics and Institute of Mathematics, Universidad de Granada; Dept. of Neurology, Max Planck Institute for Human Cognitive and Brain Sciences

Relationships of prediction and alignment between musicians' movement and rhythmical and tonal contexts of music

KEYWORDS Sensorimotor prediction; Music-related motion; Auditory modeling; Involuntary micromotion; Granger causality

Music performance requires high levels of motor control to express musical intentions. In this study, we analysed motion and audio data of 20 expert saxophone players performing four musical fragments varying in the degree of technical difficulty. Using a computational model of the auditory periphery, we extracted emergent acoustical properties of sound to infer critical cognitive patterns of music processing and relate them to motion data. Results showed that knee flexion is causally linked to real-time tone expectations as measured by our auditory model and correlated to rhythmical density, a likelihood measure on rhythmic events that relies on the roughness properties of the sound. These findings underline the robustness of body movement in musical performance, providing valuable insights for the understanding of musical expression and development of motor learning cues.

MARC VIDAL

Marc Vidal holds a bachelor's degree in music and communications. He received his master's degree in mathematical statistics from the University of Granada. His research revolves around mathematical and applied statistics and music neuroscience. In particular, he is interested in modelling biosignals (EEG, fMRI, pupillometry) to uncover the neuromodulatory effects of motor intention during music performance tasks.

NÁDIA MOURA

Nádia Moura is a doctoral student at Universidade Católica Portuguesa and Research Centre in Science and Technology of the Arts (FCT fellowship). She holds a Master's in Music Teaching (2019) from the same institution and a Bachelor's in Music: Saxophone Performance (2017) from University of Aveiro. Her ongoing research focuses on the analysis of expressiveness and body language in saxophone performance using multimodal datasets and 3D motion capture. She has conducted research as a visiting student at RITMO (Oslo) and IPEM (Ghent). She has participated in several conferences and published in PLOS ONE and npj Science of Learning, among others.

Marina Mezzina

Salerno State Conservatoire 'Giuseppe Martucci'

The Moment, the Memories: how 'Poetic Temporality' Shapes Musical Structure

KEYWORDS Lied; Schenkerian analysis; double-faced structure; poetic/music temporality

The philosophical debate on the relationship between temporality and self-consciousness influenced the greatest Romantic poets, so that "time" emerges in their poems as a highly mediated literary construct based on a dynamic understanding of past and future.

When confronted with the problem of time and its paradoxes, is it possible for the musical structure to remain motionless and unchanged?

This paper will identify three examples of non-normative choices from Lied repertoire determined by an adhesion of musical structure to a text highly characterised by an ambiguous and destabilised temporality.

Each of these "deviations" leads to a double-faced structure that extends to the representation of Erinnerung: minor tonic/major mediant pairing; dominant axis/plagal axis; tonal domain/Phrygian domain.

This marked structural ambiguity in response to the temporal antithesis demonstrates how musical structure can be bent for this specific purpose, moving away from normativity to the point of almost singing the expressive impact of the present pain evoked by the past.

MARINA MEZZINA

Marina Mezzina is Professor of Music Theory and Perception at the Conservatorio di Musica in Salerno and, from 2019, Head of the Department of Music Theory and Analysis. She holds degrees in piano and vocal chamber music. She also holds a Master's degree in music theory and analysis (thesis on Schenker's early studies of the German Lied). Her main research interests are lieder, art songs and musical theatre, as well as early eighteenth-century compositional practice. Her publications include essays on Britten's theatre, songs, aural training and music perception. She's taken part in analytical conferences in Italy and Europe, and is vice-president of GATM and co-editor of RATM (Music Theory and Analysis).

Martin Clayton and Sayumi Kamata

Durham University

Metre and free rhythm in gagaku music

KEYWORDS Metre; free rhythm; Japanese music; empirical; movement

Japanese court music and dance, known as gagaku, exhibits a number of unique features in terms of rhythmical structure, ensemble coordination and synchronisation. One of these is the coexistence of metrical-formal sections and free-rhythm sections (jobuki) within a suite. We analyse a recorded corpus of instrumental music, focusing specifically on the two jobuki sections and contrasting them with related metrical-formal sections. Our empirical analysis of sound and movement employs timing information derived from multitrack audio as well as movement information extracted from video using the OpenPose algorithm, and explores onset periodicity, body sway, and acceleration as revealed by both metrical structure and phrase durations in the wind parts. The results reveal that even in jobuki, which does not exhibit the metrical-formal structure, performers share certain principles regarding temporal organisation and coordination, providing new insights into the link between metre and free rhythm.

MARTIN CLAYTON

Martin Clayton is Professor in Ethnomusicology in Durham University. His research interests include Hindustani (North Indian) classical music, rhythmic analysis, musical entrainment and embodiment.

SAYUMI KAMATA

Sayumi Kamata is a researcher at Tokyo National Research Institute for Cultural Properties. She studied at Tokyo University of the Arts, where she obtained degrees in Musicology (M.A. in 2015 and Ph.D. in 2018). Her research interests include traditional performing arts, rhythmic analysis, musical embodiment, transmission of performance techniques and history of performer communities. Traditional Japanese music ensemble is at the centre of her research, with ongoing field research and analysis of related materials. She directs a research project "'Ma" in Japanese music ensembles: exploring the scope of temporal expressions', funded by the Japan Society for the Promotion of Science.

Nariá Ribeiro

NOVA University

**Exploring the rhythmic antinomy beat-based/
non-beat-based in Xenakis' Jonchaies****KEYWORDS** non-beat-based rhythms; Xenakis; Jonchaies; rhythmic analysis

Jonchaies, Xenakis' orchestral piece, combines passages with clear beat sensation with processes in which beat sensation is perturbed as well as completely abolished. A rhythmic analysis is done to describe how beat sensation oscillates throughout two sections of the piece. As beat sensation involves the presence of periodic articulations or accents, we use mostly score analysis combined with attentive listening of the piece, but we also use spectrograms to illustrate global structures as well as plug-ins in Sonic Visualizer for beat tracking to map periodicity rates.

We discuss the definition of beat sensation both in music theory and music perception and point out some methodologic difficulties that this topic brings since beat sensation is a psychological phenomena. We also propose future developments both in this experimental methodology for rhythmic analysis and in characterization of rhythm in the 20th century music.

NARIÁ RIBEIRO

Nariá Assis Ribeiro has bachelor and master degrees in music from Federal University of Rio de Janeiro (Brazil). She is currently a PhD student in musicology at Nova University in Lisbon (PT). In 2022 the Foundation for Science and Technology (PT) granted her with a doctoral scholarship. She has published the articles "Allen Winold's concept of unusual metric structure with obscured pulse" and "Phonograph effects, modernism and sound art: a reading (listening) of O Som é um texto desmutado – b-Alúria (Gabriela Nobre)". Among her research interests are: 20th and 21st centuries' music; non-beat-based rhythm; beat perception; electronic music.

Nathan Martin

University of Michigan

Some Paradoxes of Musical Temporality**KEYWORDS** Form Function; Roman Ingarden; Beethoven; Wagner; Frank Kermode

Music is a temporal art. But its temporality is unusual. Successive moments may be conceptually simultaneous; sections can jump backwards, and perhaps also forward in time; large-scale reprises often seem to recapture earlier stages. More generally, musical works themselves appear to stand both inside and outside of time: their parts succeed one another, but they are also simultaneously co-present.

My overarching claim is that a detour—on the face of it, a surprising one—through medieval angelology can help to clarify the temporal structure of musical works in ways that illuminate pragmatic questions of musical analysis. The key category is Aquinas' notion of *aevum* as a distinct temporal order somehow mediating between *tempus* and *aeternitas* and characteristic of angels and other celestial objects—an idea that Frank Kermode (borrowing largely from Ernst Kantorowicz) raised in 1967 in considering similar temporal paradoxes that arise in works of literature.

NATHAN MARTIN

Nathan John Martin is associate professor of music theory at the University of Michigan. His research interests are in the history of music theory and the analysis of musical form. He has published widely on these topics in journals such as *Music Theory Spectrum*, *Music Analysis*, and the *Journal of Music Theory*. During the summer of 2023, he was a visiting research at the Max Planck Institute for Empirical Aesthetics in Frankfurt.

Nicholas Phillips

Oxford Brookes University

Bridging cultural time zones: the treatment of time in Mascagni's 'Cavalleria rusticana'

KEYWORDS Time; Opera; Verismo; Narrative; Modernity

Nineteenth century travellers to the rural south of Italy had to be warned about the system of time that existed there. This was based on the hour of 24 o'clock being set approximately half an hour after sunset, a system that pre-dated the invention of mechanical clocks. I will examine how this system of time affected the telling of the story of Cavalleria rusticana and how time and narrative were dealt with in the final opera. This will lead to a discussion of how controlling time underlined the power of the church in the rural south and the state and capitalism in urban environments, emphasising these cultural differences and showing how the opera bridged this divide.

NICHOLAS PHILLIPS

Nick Phillips BSc MA FCA is a third year PhD student at Oxford Brookes University, working under the supervision of Prof Alexandra Wilson and Dr Alessandra Palidda. He is examining the effects of modernity, place and cultural power on late nineteenth- and early twentieth-century Italian opera. This work includes studies of operas in their surroundings, both rural and urban and how the social context of Italy at the time is reflected in the work. He has a Masters in Music from the Open University. Prior to retiring to undertake this work, he worked initially as a Chartered accountant and latterly as an Associate Professor for University of Warwick, teaching Accounting and Finance and managing programmes in China.

Nicole Biamonte

McGill University

Clave-Family Rhythms in Popular Music

KEYWORDS clave; tresillo; rhythmic dissonance; texture

Rhythm is one of the most salient parameters in popular music, because of the explicit beat often provided by the drums and the pervasive use of rhythmic dissonance. This paper investigates clave-based rhythmic dissonances, which are more pervasive in popular music than is generally recognized. The introduction discusses some historical factors that influenced the clave rhythm's global distribution. The next section of the paper discusses some mathematical properties of this family of rhythms that may contribute to their prevalence, among them maximal evenness, maximal individuation, prime generation, grouping dissonance, and cyclic realignment. Tresillo rhythms (3+3+2, the first part of the clave) in particular are overdetermined: they are optimized for perception, cyclicity, and entrainment. The final section catalogs clave-family rhythms common in Anglophone popular music (Charleston, tresillo, double tresillo, habanera, "Bo Diddley", son clave, bossa clave, and rumba clave) and analyzes illustrative examples and their functions within the musical texture.

NICOLE BIAMONTE

Nicole Biamonte is associate professor of music theory at McGill University. Her primary research area is the theory and analysis of popular music, focusing on pitch structures, meter and rhythm, form, and most recently timbre. She has also published on music theory pedagogy, public music theory, and 19th-century musical historicism. In addition to her edited collection Pop-Culture Pedagogy in the Music Classroom, her work appears in the journals *Music Theory Spectrum*, *Music Theory Online*, *Journal of Music Theory*, *Zeitschrift der Gesellschaft für Musiktheorie*, *Intégral*, and *Beethoven Forum*, as well as in numerous edited collections.

Nuno Trocado

Centre for Interdisciplinary Studies (CEIS20) and Faculty of Arts and Humanities of the University of Coimbra

“Cramming”: lived time in Charlie Parker’s rhythmic phrasing

KEYWORDS Charlie Parker; microtiming; embodied musical cognition; musical time; jazz

The term “cramming” refers to the practice, found notably in the improvised solos of Charlie Parker, of producing bursts of faster passages built from time-compressed idiomatic materials, with a strikingly asymmetric but flowing rhythmic attribute. Considering that the phenomenon is not reducible to a simplistic diminution, I analyze available recordings suggesting three interconnected vectors of temporal tension: (1) emerging from the friction between familiar motives and new unexpected temporal relations to the underlying pulse and harmonic unfolding, modulating expressive microtimings; (2) through the reduction of onset intervals, approaching perceptual strata where unit discrimination is challenged; and (3) by reconstituting embodied analogs, in particular in the domain of speech prosody. These tensions create a locus of individual and collective engagement, dynamically shaping the quality of lived time.

NUNO TROCADO

Nuno Trocado is pursuing a PhD in artistic studies at the University of Coimbra. He’s also active as a guitarist in improviser’s groups, and as a multifaceted composer. Recent highlights include *Cotovelo* (2017) and its follow-up *Umbral* (2021), both music/theatre monologue crossovers; commissions by *Coreto*, *Arte no Tempo*, and *Orquestra Jazz de Matosinhos*; the multimedia project *Expurgar* (2021), led by visual artist Dária Salgado; *Naiad Splash* (2022) for guitar, two saxophones, and multichannel electronics; *Vestiges* (2019) and *Corrosion* (2023), the recorded outputs of a trio with multi-reedist Tom Ward and bassist Sérgio Tavares.

Rainer Polak

RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion

Cultural plasticity of cognitive constraints on rhythm perception in listeners from Mali: an interdisciplinary approach.

KEYWORDS cultural variation in rhythm perception; West African timelines; metric hierarchy; rhythmic interpolation; aesthetic co-evolution

The paper applies music analysis and ethnographic research to examine in detail two experimental findings on rhythm perception in listeners from Mali as reported in a cross-culturally comparative cognitive science paper (Jacoby et al. 2021). It shows that musical cultures can suggest radically diverse perceptions of even the simplest rhythmic ratios (Case 1) and play around with, and push the limits of, cognitive constraints on rhythmic ratio complexity (Case 2). This suggests that music-cultural traditions provide a framework for socio-cognitive niche construction, where musical forms and perceptual structures co-evolve. It thus contrasts with the more conventional view of perceptual structures as universally stable biological constraints on the culturally contingent and historically dynamic world of musics. At the level of methodology, the paper argues that the impact of music analysis and ethnography on music cognition research can and should go beyond their traditional role of providing testable hypotheses.

RAINER POLAK

Rainer Polak is a researcher specializing in percussion music and dance from West Africa. At the RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion, he leads a multidisciplinary project on multimodal rhythm perception and production in djembe music and dance from Mali. During the spring 2023 term, he served as the Benedict Distinguished Visiting Professor of Music at Carleton College. Previously, Polak was a researcher at the Max Planck Institute for Empirical Aesthetics (2017–2022) and the Hochschule für Musik und Tanz Köln (2011–2016).

Riccardo D. Wanke

CESEM – Centre for the Study of the Sociology and Aesthetics of Music, NOVA University

The spectrotemporal potential of sound-based music: a morphodynamical connection to the world.**KEYWORDS** Sound-based Music; Auditory Gestalt; Embodied Cognition; Sound Aesthetics; Morphodynamic Theory

This paper proposes that the perceptual-cognitive mechanisms involved when listening to “sound-based” music (post-spectralism, glitch-electronica, electroacoustic music) are best understood within a connectionist cognitive framework described by morphodynamic theory. The sound patterns found in this music engage listeners more readily at a phenomenological level rather than through establishing long-term conceptual associations, appearing to the listener as “image schema”, as they embody Gestalt and kinaesthetic principles portraying the forces and tensions of our being in the physical world (figure-background, near-far, superimposition, compulsion, blockage). This paper discusses the results of a listening survey which explores the functional isomorphism between sound patterns and image schema. The results suggest that this music can be seen as a mean term within a connectionist model between the acoustic-physical world and the symbolic level. This new perspective opens up new pathways to access sound-based music and to a more general understanding of today’s modes of listening.

RICCARDO D. WANKE

Riccardo D. Wanke, author of the book *Sound in The Ecstatic-Materialist Perspective on Experimental Music* by Routledge (2021), is an experienced multidisciplinary researcher in both the humanities and the natural sciences. He has authored (and co-authored) contributions in musicology and related topics such as music theory, music perception/cognition, aesthetic. Central of his research is the bridge between cognitive psychology and musicology in the field of arts. As a composer and performer, he explores the electronic manipulation of sound, having performed live worldwide and published music for international labels.

Scott Murphy

University of Kansas

Duplex Syncopation Classes and Spaces, and Their Application to Western Popular Song**KEYWORDS** syncopation; popular song; categorization; spatialization; Madonna

The concept of grouping dissonance enjoys fairly well-defined sub-categories such as tresillo, double tresillo, Platonic, and Platonic-trochaic (Biamonte 2014, Cohn 2016, Murphy 2016). Displacement dissonance has not enjoyed a comparable degree of subclassification. I propose one way to finely categorize displacement syncopations in popular song, enabling not only broad inquiries into style, but also close analyses of individual songs. This study focuses on the duplex syncopation classes for spans of an even number of m units: each has exactly two non-contiguous 1s interspersed among a succession of 2s, resulting in $((m/2) - 1)^2$ syncopation classes. These classes can be arranged into a two-dimensional grid, in which adjacency represents maximal onset overlap, analogous to some of Cohn’s (e.g. 2001) metric spaces. Madonna’s “Papa Don’t Preach” (1986) moves mostly incrementally around one such space, with increases and decreases in one dimension generally corresponding to expressions of anxiety and tenacity, respectively.

SCOTT MURPHY

Scott Murphy has taught music theory at the bachelor’s, master’s, and doctoral levels at the University of Kansas (US) since 2001. Two of the foci within his research activities are Brahms—for which he has won two publication awards from the Society for Music Theory—and film and television music, about which he has written ten book chapters and articles. Other subjects of his recent articles include fugue strettos and pitch-class-set proxemics in Holst’s “The Planets”, and he is currently writing a book applying economic theories to western classical and popular tonal styles.

Tian-Yan Feng

Postgraduate, MScR, University of Edinburgh

Temporality, Philosophical Time, and Compositional Approach in Igor Stravinsky's Works: The Case of Symphony in C**KEYWORDS** Igor Stravinsky; temporality; ontological time; Symphony in C (1938-40); similarity

Numerous substantial analytical studies have been dedicated to the works of Igor Stravinsky (1882-1971). Many of these analyses delve into temporal aspects, exploring issues such as repetition, reiteration, variation, continuity and discontinuity, inconsistency, non-progression, multiple melodies, timelessness, moment form, and so on. However, previous analyses have rarely explored the connections between temporal philosophies, notably those of Pierre Souvtchinsky and Henri Bergson, and Stravinsky's own verbal accounts and introspections of temporal aesthetics and compositional approach. This study investigates the origins of Stravinsky's temporal aesthetics in music and examines how these philosophical influences (e.g. 'spatial time/le temps espace,' measurable time vs 'duration/la durée' or 'subjective time') have shaped his compositional techniques. It takes Stravinsky's Symphony in C (1938-40) as an example to illustrate the interplay between philosophy, temporal notions, and compositional approaches within an interdisciplinary context.

TIAN-YAN FENG

Feng Tian-Yan graduated from the National Taiwan University Graduate Institute of Musicology in 2019 and is going to complete a second master's degree at the University of Edinburgh in 2023. He has published conference papers in 'East Asian Research Forum for Graduate Students in Musicology: CUHK-NTU-EARS Graduate Music Forum' (2018), 'The Taiwan Musicology Society and Taiwan Musicology Forum Annual Meeting' (2018, 2020), and '10th European Music Analysis Conference' (2021). Currently, he is focusing his research on music analysis, the issue of temporality in the Russian composer Tchaikovsky, as well as his symphony works. In October, he will enrol at the Hochschule für Musik und Theatre Hamburg for his doctoral study.

Tomas Lenc

Institute of Neuroscience (IONS), Université Catholique de Louvain, Louvain-la-Neuve

From sound to periodic beat: using electrophysiology to capture internal representation of musical rhythm**KEYWORDS** rhythm processing; musical beat and meter; electrophysiology; frequency-tagging; transformation

Across cultures, people tend to spontaneously perceive and move the body along with a periodic beat when listening to music. However, the neural processes that support beat perception remain largely unknown. Here, we review a recent line of research investigating these neural processes using electrophysiological recordings of brain activity. This research provides converging evidence that beat perception involves transformation of rhythmic stimuli into a neural format with emphasized beat periodicity. This transformation is observed at the earliest cortical stage of sound processing, namely in the primary auditory cortex, and seems to be present in human adults and infants as well as non-human primates, although it cannot be explained by acoustic properties of the input or subcortical auditory processing. This "periodized" format may thus constitute a basis for further neural processes driving temporally coordinated musical behaviors.

TOMAS LENC

Tomas Lenc is a postdoctoral research fellow at the Rhythm and Brains lab (IONS, UCLouvain, Belgium). During his PhD at the MARCS Institute for Brain, Behaviour and Development (Western Sydney University, Australia) he used electroencephalography (EEG) and behavioral methods to clarify the nature of processes that support perception and sensory-motor synchronization with musical rhythm. Currently, he continues to follow this line of research, aiming to map the functional network of brain regions involved in musical beat processing. He is generally interested in how the brain makes sense of musical rhythm by transforming rhythmic sensory features into behaviorally-relevant internal categories.

Vasilis Kallis

University of Nicosia

Musical Temporality - Reflections on the Implication of Secondary Musical Parameters

KEYWORDS secondary musical parameters; musical time and temporality; form, formal functions and rhetoric; the Beatles; popular music

Kramer and Monelle, among others, address the application of time and temporality to music. Both, as well as most of the writers engaging with the subject agree that our experience of time is multitemporal and that (musical) multi-temporality plays a significant role in the creation and perception of music.

Considering the Beatles' 'A Day in the Life', I aim to correlate various aspects of musical temporality with the perception of formal functions and formal rhetoric, and address the implication of Meyer's secondary musical parameters in this perceptual process. Elements such as calmness, animosity, and the dialectic between stasis and kinesis can, context permitted, facilitate the generation of Monelle's lyric and/or progressive time; or, from Kramer's perspective, condition partially the sense of linearity and nonlinearity. Presently, the three episodes that are interweaved with sections A and B of an apparent ABA structure, in addition to being form-shaping agents, engage in calculated shifts between lyric and progressive time.

VASILIS KALLIS

Vasilis Kallis received his Ph.D. from the University of Nottingham. Currently, he serves as Professor of Music Theory at the University of Nicosia. His research focuses on methods of pitch organization in early twentieth-century music, scale theory (particularly non-diatonic modes), *formenlehre*, and popular music. He has published in renowned journals such as *Music Analysis*, *MTO*, and *Rivista di analisi e teoria musicale*. He is the co-editor of *Demystifying Scriabin*, and Volume 3 of the peer-reviewed journal *Mousikos Logos* (Greece). Kallis has also contributed entries in the *Grove Music Online* as well as chapters in various books in the fields of musicology and music theory.

