

# THE ART OF THE STRING MULTIPHONIC

## Symposium

**27. & 28. Januar 2022**

**Musik-Akademie Basel**

Leonhardsstrasse 6, 4051 Basel – Eintritt frei / Free admission

Ein Symposium der Forschungsabteilung der Hochschule für Musik FHNW.  
Dieses Projekt wird durch Zuwendungen der Walter Fischli – Stiftung ermöglicht.

Wir danken allen Förderern für ihre Unterstützung.

## Thursday, January 27

### Studio 2

#### STUDENT WORKSHOPS

Led by Ellen Fallowfield (cello), Gunnhildur Einarsdóttir (harp), Seth Josel (guitar/E-guitar), Sanae Yoshida (piano)

10:00	Greeting
10:30	Technique workshop CELLO and HARP
11:30	Technique workshop GUITAR and PIANO
12:30	General questions
13:00	Lunch
14:00	Student composer sketches

## Friday, January 28

### Grosser Saal

#### LECTURES

14:00	Ellen Fallowfield: Cello Multiphonics: Technical and Musical Parameters
14:30	Marc Sabat and Thomas Nicholson: Farey Sequences Map Playable Nodes on a String
15:00	Thomas Cizak & Seth Josel: Of Neon Light: Multiphonic Aggregates on the Electric Guitar
15:30	Sanae Yoshida: The Microtonal Piano and the Tuned-In Interpreter
16:00	Gunnhildur Einarsdóttir: Multiphonics on the Harp: Initial Observations
16:30	Caspar Johannes Walter: Multiphonics on Vibrating Strings

## LECTURES: ABSTRACTS & BIOS

### **Dr Ellen Fallowfield:**

#### **Cello Multiphonics: Technical and Musical Parameters**

This lecture presents selected results from a research project on cello multiphonics at the Hochschule für Musik FHNW in Basel within which I am producing updated fingering charts in a smartphone application and affiliated online repository. Here, I detail work that has informed this resource and illustrate results that reveal critical questions and point to future areas of interest. I firstly introduce cello multiphonics and contextualise my previous findings. I then discuss pitch content, 'chain' multiphonics and the balance and intonation of multiphonic components.

**Ellen Fallowfield** is an active performer and researcher in the field of contemporary music. She studied cello and new music performance at the Hochschule für Musik FHNW in Basel; ZHdK, Zürich and Kunst Universität, Graz. A grant from the Leverhulme Trust enabled her PhD studies at the University of Birmingham/Hochschule für Musik FHNW, Basel. She created the Cello Map App and webpage *cellomap.com* during research fellowships at the Hochschule für Musik FHNW, Basel sponsored by the Swiss National Science Foundation and Maja Sacher Foundation, and the Kaleidoscope Etudes for contemporary cello technique at the same institution, funded by an SNSF Spark fellowship. She is head of master specialized performance studies in research, contemporary music, and music in context at the Hochschule der Künste Bern.

### **Thomas Nicholson and Marc Sabat:**

#### **Farey Sequences Map Playable Nodes on a String**

Partials may be isolated on a vibrating string by lightly touching specific points along its length. In addition to the two endpoints, stationary *nodes* for a given partial  $n$  present themselves at  $\frac{1}{n}$  locations along the string, dividing it into  $n$  parts of equal length. It is not the case, however, that touching any one of these nodes will necessarily isolate the  $n$ th partial. The subset of nodes that will activate the  $n$ th partial (termed *playable nodes* by the authors) may be derived by following a mathematically predictable pattern described by so-called *Farey sequences*. The authors derive properties of these sequences and connect them to physical phenomena. This article describes various musical applications: locating single natural harmonics, forming melodies of neighbouring partials, sounding multiphonic aggregates, as well as predicting the relative tuneability of just intervals.

Canadian composer of Ukrainian descent **Marc Sabat** (\*1965) has been based in Berlin since 1999. He makes concert and installation pieces, drawing inspiration from investigations of the sounding and perception of Just Intonation, and relating to various music forms – folk, experimental and classical. He is a frequent collaborator, seeking points of shared exploration and dialogue between various forms of experience and different cultural traditions. His works are presented internationally. He co-developed the Extended Helmholtz-Ellis JI Pitch Notation and is a pioneer of music written and performed in microtonal Just Intonation. Scores and artist editions are available from Plainsound Music Edition.

**Thomas Nicholson** is a Canadian composer, keyboardist and violinist. After studying composition with Christopher Butterfield at the University of Victoria (Canada), he moved to Berlin in 2017 to work closely with Marc Sabat at the Berlin University of the Arts. Driven by (artistic) practices from many times and fields ranging from cosmology to painting to interdisciplinary experiments, his compositions since 2014 have focused on the fragile interaction between counterpoint and the distinctive harmonic *ēfusingí* evoked through microtonal just intonation (*ēpure tuningí*). He is actively researching and developing the practical means of realising microtonal music on acoustic instruments.

### **Thomas Ciszak and Seth Josel:**

#### **Multiphonic Aggregates on the Electric Guitar**

Considerable research has been made into the harmonic properties and playability of woodwind multiphonics, while string multiphonics have received far less attention. In recent years, however, there has been an increasing amount of interest in the topic, and several publications have been devoted to acoustic guitar multiphonics. Written primarily for non-guitarist composers, these studies range from the scientific to the practical. Various, they describe the sonic qualities of the multiphonics, discuss methods of performing them, or examine their spectral content and morphology. Until now, published research into guitar multiphonics has been limited to the acoustic guitar, and has examined only its three lower strings. In this study, we analyse multiphonics on the electric guitar, and present a catalogue of harmonic aggregates on all six strings. We test these aggregates on five different guitars and examine their response to three commonly used analogue effect pedals (compression, overdrive, and distortion). In order to exactly notate spectral components and harmonic nodes, we have used the Extended Helmholtz-Ellis JI Pitch Notation (HEJI).

The guitarist **Seth Josel** is based in Berlin. He is one of the leading instrumental pioneers of his generation, performing extensively as soloist and guest with orchestras and ensembles including the Berlin Philharmonic, the BBC Symphony, the Helsinki Philharmonic, Akso-Schönberg Ensemble, and KNM Berlin. Seth has premiered over one hundred works, collaborating with such composers as Helmut Lachenmann, Tristan Murail and James Tenney. He has recorded for radio stations throughout Europe and released CDs on Aeon, Kairos, Nonesuch, Mode, Wergo, and Winter & Winter. Seth is co-founder of [www.sheerpluck.de](http://www.sheerpluck.de), a website dedicated to contemporary guitar music. His book, *The Techniques of Guitar Playing*, co-authored with Ming Tsao, was published by Bärenreiter in July 2014. From 2016-2018 he was a Research Fellow at the Orpheus Institute in Ghent. Recently, he has published articles in TEMPO, Musik & Ästhetik, and MusikTexte.

**Thomas Ciszak** is a composer and music theorist in Berlin. Recent collaborations have been with ICTUS, Ensemble Mosaik, and the Brandenburgisches Staatsorchester Frankfurt. As a researcher, Thomas is focused on topics of intonation and microtonality, the history of harmonic theory, and psychoacoustics. Thomas holds a double-major in music theory and composition from McGill University, and is currently finishing an MA in composition at the Universität der Künste Berlin. Before pursuing his degrees in music, Thomas completed a BA in psychology at the University of Victoria.

## **Sanae Yoshida:**

### **The Microtonal Piano – and the tuned-in interpreter**

«The Microtonal Piano – and the tuned-in interpreter» is an ongoing artistic research project at the Norwegian Academy of Music, where the pianist Sanae Yoshida seeks to demonstrate, as a performer, how microtonality can increase the expressive possibilities of the acoustic piano. Whether scordatura (detuning of the instrument) is included or not, there are many different modes of playing that result in microtonal sounds, and in this lecture she presents a preliminary overview. For the project, she has commissioned works from several composers, and different aspects of microtonal modes of playing are integrated into their works.

Multiphonics is obviously one of these modes of playing, as it most often results in microtonality. At the end of the article, Yoshida suggests different ways that multiphonics can be modified when used in combination with some of the *other* microtonal modes of playing.

**Sanae Yoshida** is an Oslo-based pianist performing both contemporary and classical repertoire, both as a solo and chamber/ensemble musician. She has been working closely with a number of composers, and she is a founding member of *Ensemble Temporum*, a Norwegian ensemble for contemporary music.

After her studies in Toho Gakuen School of Music in Tokyo, Sanae Yoshida went to Norway to study with prof. Jiri Hlinka at the Barratt Due Academy of Music, and later on she studied with prof. Håkon Austbø. Yoshida has recorded chamber works by Monrad Johansen and Halfdan Cleve (SIMAX), and solo/chamber works by Øyvind Mæland (LAWO).

She is currently undertaking artistic research at the Norwegian Academy of Music under the project title «The Microtonal Piano – and the tuned-in interpreter».

## **Dr Gunnhildur Einarsdóttir:**

### **Multiphonics on the Harp: Initial Observations**

In this lecture I take a practical look at multiphonics on the harp from a performers point of view. I share my initial observations about their production, sound and predictability as well as their relationship to other harmonics on the harp. It is my hope that these insights will serve as a guide for further investigation of this fascinating topic.

**Gunnhildur Einarsdóttir** is a harpist specialized in the performance of contemporary music and founding member of the Berlin based Ensemble Adapter. She holds a Doctor of Music degree from the Sibelius Academy in Helsinki. Her thesis is a manual for composers on contemporary harp notation and technique. ([www.harpnotation.com](http://www.harpnotation.com)) Gunnhildur Einarsdóttir has premiered a large number of solo and chamber music for harp and continues to encourage composers to write for the harp in innovative ways. She teaches at the Darmstadt Summer Courses and regularly gives master classes and lectures on contemporary harp notation, performance and technique.

## **Caspar Johannes Walter: Multiphonics on vibrating strings**

Multiphonics on vibrating strings have been an important element in my compositions since the early 1990s. In order to calculate the frequency components of so-called pure multiphonics (multiphonics consisting of harmonic partials of the fundamental) on vibrating strings, I developed my fraction windowing algorithm. After the first section detailing the use of multiphonics in my compositions, the second part of the article discusses in detail how the fraction windowing algorithm works and its relationship to the closely related mathematical concept of a continued fraction. Another important aspect of this work are the online apps I have developed as tools for composers and performers who are interested in using these methods in their own work on string multiphonics.

**Caspar Johannes Walter** was born in Frankfurt/Main in 1964. He studied composition with V. D. Kirchner (Wiesbaden) as well as with J. Fritsch and C. Barlow (Cologne Conservatory of Music, 1985-90).

In 1985 he was cofounder of the Cologne-based Thürmchen Verlag (Publishing House). He has received several major composition awards, a CD with chamber music works by Caspar Johannes Walter released by the German Council of Music on the Label Wergo has been awarded the «Preis der deutschen Schallplattenkritik» in 1998.

His interests as an interpreter – he is cellist in the Thürmchen Ensemble, which he also co-founded in 1991 – are focused primarily on young composers from the areas of experimental music and musical theatre.

In 2002/2003 Caspar Johannes Walter was teacher of composition and composer in Residence at the University of Birmingham/UK, since 2006-13 he was professor for composition in Stuttgart/Germany and since 2013 at the Hochschule für Musik FHNW in Basel/Switzerland. In 2014 he was elected into the «Akademie der Künste, Berlin», where he has recently curated the international project «Labor Beethoven 2020», that focusses the view of the young generation of composers towards the renewing of intrinsic musical ideas in the spirit of Beethovens «laboratorium artificiosum».

## Friday, January 28

### CONCERT

19.30

Øyvind Maeland (NO)  
(b.1985)

in earth (2022, UA)  
electric guitar, harp, cello, piano

Elnaz Seyedi (De/IR)  
(b.1982)

a very close look from far away (2016/17)  
guitar, cello, video

Caspar Johannes Walter (De/CH)  
(b.1964)

Multiphonic-Aphorismus (2022, UA)  
harp, steel string guitar, piano, cello

Jessie Marino (De/US)  
(b.1981)

gradient maps of fallow fields (2021, UA)  
cello, tape

Arash Yazdani (Es/IR)  
(b.1985)

Hommage à Alvin Lucier (2021/22, UA)  
egtr, pno, vc, electronics

Idin Samimi Mofakham (NO/IR)  
(b.1982)

Nežm (2021, UA)  
piano, cello

Paul Clift (CH/Aus)  
(b.1978)

The Grammar of Shadows (2021, UA)  
electric guitar, harp, piano, cello

### Performers:

**Ellen Fallowfield – Cello**

**Seth Josel – Guitar/e-guitar**

**Gunnhildur Einarsdóttir – Harp**

**Sanae Yoshida – Piano**

### **Øyvind Mæland: in earth (2022, UA) for electric guitar, harp, cello, and piano**

«In this new work for string-multiphonic quartet, I will search for multiphonics that are relatively similar across the 4 different instruments in terms of pitch content and timbre. The work will proceed calmly, as a two-voiced quasi-infinite phrase of alternating duo-combinations. The durations will however vary a lot due to the variation in natural sustain (length) of the various multiphonics, and the musicians must avoid 'holes' in the music while at the same time trying to force through the calm. The piece will use this essentially technical 'tension' to create a dialogue and structure.»

The Norwegian composer **Øyvind Mæland** (1985) studied the piano at the Barratt Due Institute of Music with Jiri Hlinka, before studying composition at the Norwegian Academy of Music with Olav Anton Thommessen, Ivar Frounberg and Henrik Hellstenius. He has also participated in several masterclasses with composers such as Aperghis, Furrer, Billone, Ferneyhough, K. Lang and Czernowin.

He is often writing for voice and for ensembles, and he has worked with musicians and ensembles such as Håkon Austbø, Marco Fusi, Hans-Kristian Kjos Sørensen, Stine Motland, Neue Vocalsolisten Stuttgart, Pinquins, Oslo String Quartet, Kairos Quartett, Uusinta, Aksiom, Bit20 with Pierre-André Valade, Stavanger Symphony Orchestra, Telemark Chamber Orchestra, Ensemble Ernst, Bodø Sinfonietta and the Oslo Sinfonietta. His music has been performed several times at festivals such as Ultima, Borealis and Oslo International Chamber Music Festival.

His nearly 2-hour long opera *Ad undas – Solaris Korrigert* (based on Øyvind Rimbereids poem «Solaris Korrigert») was staged at the Norwegian National Opera & Ballet in 2013. Several of Mæland's works have been recorded on the labels of Lawo, Fabra and Geiger. [www.oyvindmaeland.com](http://www.oyvindmaeland.com)

### **Elnaz Seyedi: a very close look from far away (2016/17) for Guitar, Violoncello and Video**

The piece is based on these verses of Sohrab Sepehri's (1928-1980) poem *Behind the Seas*:

I'll build up a boat  
I'll sail away  
I'll be far from this strange earth

**Elnaz Seyedi** was born in Tehran in 1982, she studied piano with Ali Gorji and Farimah Ghawam-Sadri and music theory and composition with Alireza Mashayekhi. From 2007 to 2017, she studied composition with Younghi Pagh-Paan and Jörg Birkenkötter at Hochschule für Künste in Bremen, with Caspar Johannes Walter at Hochschule für Musik in Basel and with Günter Steinke at Folkwang University of Arts in Essen. She has received awards and scholarships like Bernd-Alois-Zimmermann-Scholarship of the City Cologne and Ensemble Phoenix Basel Competition prize in 2017 and DAAD Scholarship in 2016. In 2018/19 she was Composer in Residence at International Ensemble Modern Academy (IEMA) in Frankfurt am Main in Germany, 2020 Composer in Residence by Bartels Foundation at Atelier zum Markgräflerhof in Basel, 2021 Composer in Residence in Künstlerhof Schreyahn.

Her music has been performed among others at numerous festivals such as Wittener Tage für Neue Kammermusik, Venice Art Biennale, Huddersfield Contemporary Music



Festival, Darmstädter Ferienkurse, Ultraschall Berlin, Festival Mixture Barcelona, the Acht Brücken Festival in Cologne, ZeitRäume Basel – Biennale for Contemporary Music and Architecture Basel, Bludener Tage zeitgemäßer Musik, Gaudeamus Muziekweek in Utrecht, Festival Leicht über Linz, Musica Insieme Panicale Italy, Tehran International Electronic Festival and the Klangwerkstage in Hamburg.

Her works are published by Edition Juliane Klein, Berlin.

**Caspar Johannes Walter: Multiphonic-Aphorismus (2022, UA) for harp, steel string guitar, piano, and cello**

Die an sich eher statischen Multiphonics werden in diesem sehr kurzen Stück ins Fließen gebracht. Multiphonics entstehen aus dem Pochen kurzer gedämpfter Töne. Gruppen ähnlicher Mehrklänge von Harfe, Klavier und Gitarre wiederholen sich und bilden eine pulsierende musikalische Zeit. Aus Cello-Linien erwachsen Drehbewegungen von glissandierenden künstlichen Multiphonics, ähnlich einem Klang einer Kugel, die auf einer verrosteten Dose rollt.

Bio: see page 6

**Jessie Marino: Gradient maps of fallow fields (2021) for cello and tape**

*«gradient maps of fallow fields» was written for Ellen Fallowfield as a creative offering to her dedicated research and documentation of multiphonics on the cello. An homage to the wonderful piece «Charles Curtis» by Alvin Lucier, «...fallow fields» pulls focus onto the natural phenomena of beating patterns caused by frequency modulations against pure tones. This time, the electronics remain static and it is the cello that wavers – using the aural instability of the bowed multiphonics as a disturbance to the static drone of the sine tones.*

**Jessie Marino** is a composer, performer, and media artist based in Berlin. Her pieces score out sound, video, gesture, lighting, and staging, treating each of these elements as possible musical material.

In 2018 Marino received the Rome Prize in music composition at the American Academy in Rome. She has recently been commissioned by Pinguins/Ultima Festival (NO), Darmstadt International Summer Course (DE), Borealis Festival (NO), Huddersfield Contemporary Music Festival (UK), and Transit Festival (BE). Her work has made recent appearances at the BAM! Festival for MusikTheater (Berlin), Festival Musica (Strasbourg), Heroines of Sound (Berlin/MX), LA Chamber Orchestra Contemporary Series and her pieces have been performed by formidable new music ensembles such as KNM Ensemble (DE), SCENATET (DK), SoundInitiative (FR), We Spoke Percussion (UK), Decoder Ensemble (DE), Ensemble Adapter (DE), Die Ordnung Der Dinge (DE), and Ensemble Pamplemousse (USA). Marino studied composition at Wesleyan University with Alvin Lucier and Ronald Kuivila and she earned a DMA in musical composition from Stanford University, working with sound artist Paul DeMarinis.

### **Arash Yazdani: Hommage à Alvin Lucier (2021/22, UA) for electric guitar, cello, piano, and looper pedals**

I have undertaken extensive research on multiphonics on piano strings, and studying various acoustical/psychoacoustical aspects relevant to the subject of piano sounds. Additionally, I've used the phenomena on other string instruments, including in «Aus tiefer Not...» for solo cello. I have always imagined making a compendium composition using live and recorded material, not as a demonstration of research but as a purely artistic interpretation.

The piece will be for augmented ensemble because looper pedal will be used in various instruments. I plan to use looper pedals and SFX pedals, coupled with a detailed (micro-intervallic) scordatura scheme. The piece will explore a junction between micro-interval music and sounding elements of rock music.

I plan to use the material from my current research database in an artistic context, where the musicians will trigger database material in clusters combined with what they play.

An investigation on the combination of acoustics and psychoacoustics, alternate intonation and heavy metal elements, is a new realm for me that I will explore here.

Iranian-born composer and conductor, **Arash Yazdani** studied at Tehran superior conservatory (University of Applied Science and Technology), The Royal College of Music in Stockholm, Hochschule für Musik Basel, and the Estonian Academy of Music and Theatre. A recipient of the Jonathan Harvey Scholarship, he is currently a teaching assistant and PhD candidate at the University of Huddersfield. He was formerly a research fellow at the Institut für Elektronische Musik und Akustik- IEM Graz.

Arash is artistic director of Sound Plasma, festival for alternative intonation music in Berlin and Tallinn, and artistic director and conductor of Ensemble for New Music Tallinn.

Yazdani's compositions are characterized by the application of acoustic and psychoacoustic phenomena to the fabric of music. His 2018 orchestra piece, NAKBA, was selected to represent Estonia in the International Rostrum of Composers 2019. He won the first at the composition competition «Welcoming Maqam» in Berlin 2016 and was the first prize winner of «Speech, Text, Silence» composition Competition of ensemble Lemniscate in Basel in 2015. He holds an honorary diploma from the Sergei Slonimsky composition competition 2015 and Gold Coin national award for best art school diploma from the Iranian ministry of culture.

### **Idin Samimi Mofakham: Nežm (2021, UA) for cello and piano**

Nežm, in the Parthian language, means «the winter's morning mist».

The non-solid shape of multiphonic sound with its evanescent components, which is unstable and fragile in its character, somehow reminds me of a mist's structure. It contains solid ingredients (overtones of a fundamental tone) which simultaneously are suspended in air (duration of the multiphonic). It is reliable and yet impossible to grab. It can change its form with flexibility, yet it changes its shape even in very short amounts of time.

The composition focuses on the morphology of multiphonic components and the transformation between noises and sounds by manipulating multiphonic structures in different temporal and spatial layers.

The music of Iranian composer/performer, **Idin Samimi Mofakham** (\*1982) is deeply based on the traditional and regional music of his home country. Since 2015, He has developed his own musical language based on the medieval Persian tuning systems, just intonation, and Psychoacoustics.

Idin is the co-founder and artistic manager of Spectro Centre for New Music since 2013, along with Polish composer & conductor Martyna Kosecka. Since 2015 he has served as a co-founder, board member and senior curator of Tehran Contemporary Music Festival, the international music festival with focus on contemporary and experimental music in Iran.

In 2019, Idin was awarded a position in Artistic Research, PhD, at the Norwegian Academy of Music in Oslo (Norway) to pursue his research on Persian medieval tuning systems and its creative usage in contemporary composition. <http://www.idin-samimi.com/>

**Paul Clift: The Grammar of Shadows (2021, UA) for electric guitar, harp, piano, and cello**

String multiphonics, a phenomenon that has no doubt been observed for as long as stringed instruments have been played, are largely absent from the modernist western musical canon, not because composers in the past were not seduced by their remarkably rich and complex nature – resembling, at least to my ear, timbres which can ordinarily only be produced by the use of electronics, whose expressive power lies in their capriciousness and volatility –, but because to reliably reproduce them in a musical setting requires a level of precision on the part of the performer that could not reasonably be ensured. Today, thanks in no small part to the efforts of cellist Ellen Fallowfield, these sonic entities are no longer floating just beyond the cliff edge; and like some newly-learned lexicon, can be applied to elegantly articulate complex notions that, without them, would be convoluted and cumbersome.

In this piece, it is my intention to explore the divergent ways in which multiphonics manifest themselves on each of the four instruments as rigorously as possible, to combine elements that are conceptually related but sonically disparate into a narrative of textures of tremendous timbral complexity. At the same time, I will treat multiphonics as building blocks of harmonic entities which will emerge, grow, and evolve into new species over time, and as I seek to do in my works in general, delineate the structure according to a clear and perceptible harmonic trajectory.

## More resources

*The Art of the String Multiphonic*, TEMPO Special Issue, Vol. 74, No. 291, January 2020, edited by Ellen Fallowfield & Christopher Fox, published by Cambridge University Press

<https://www.cambridge.org/core/journals/tempo/issue/3655B6D8704DB8B723815C29F7A7D4CC>

Cello Map by Ellen Fallowfield

<https://www.cellomap.com>

Website by Gunnhildur Einarsdóttir

<http://harpnotation.com>

Josel, Seth F. / Tsao, Ming: *The Techniques of Guitar Playing*, published by Bärenreiter Verlag

<https://www.baerenreiter.com/en/shop/product/details/BVK2243/>

The Microtonal Piano by Sanae Yoshida

<https://www.researchcatalogue.net/view/899473/899474>

## Kontakt

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