

## I. President's Foreword



Dear members and friends of the Society,

This introduction to the seventh Newsletter of the Society is first and foremost an expression of deep gratitude for continuity in our initiative and for excellent accomplished work. One of the co-editors of the Society's Journal of Mathematics and Music (JMM), Marek Źabka stepped down

from the role and has been succeeded by Clifton Callender, College of Music, Florida State University, Tallahassee. We want to thank Marek for his strong engagement and welcome Clifton to managing the journal with Tom Fiore in the best possible style. Of course, we all are extremely grateful for the work of JMM's review editor Jonathan Wild, our treasurer David Clampitt, and, last but not least, Johanna Devaney, who does a wonderful work in her role as the Society's secretary.

Again, the field of our interests, bringing mathematics and music together conceptually and in practice, has seen remarkable initiatives. In November 26-29, 2014 the International Congress on Music and Mathematics was held in Mexico's Puerto Vallarta, and its organization by Emilio Lluís-Puebla (Head of the Congress), Gabriel Pareyon (Program chair), and Guerino Mazzola (Honorary president) has realized a wonderful venue on the coast of the Mexican Pacific, with the participation of many members of our Society. The conference proceedings will be published by Springer, which is still another proof of Springer's constructive collaboration with our Society. After four international seminars on Mathematical Music Theory, the first having been organized by Emilio Lluís-Puebla in 2000 in Saltillo on the occasion of the annual meeting of the Mexican Mathematical Society, this conference in Puerto Vallarta is a proof of the remarkable contribution of Mexican scholars to the development of our Society's ideas and goals.

In the concluding panel of the conference of Puerto Vallarta, we were happy to announce the offer of Emilio Lluís-Puebla to organize the next MCM conference in 2017 at the Universidad Autónoma de México (UNAM). We want to thank Emilio wholeheartedly for this attractive and firm engagement, and we know that he has already initiated the reservation of relevant space for this next conference. In his double role as a classical performing pianist and a professor of mathematics, he will for sure turn this idea into a wonderful event.

February 13-15 2015, the Institute for Mathematical Sciences and the Yong Siew Toh Conservatory of Music of the National University of Singapore realized another remarkable conference on mathematics and music, entitled "Mathemusical Conversations", and reaching from theory to musical practice. This event was organized by Gerard Assayag

and MCM member Elaine Chew in partnership with the Centre for Digital Music at Queen Mary University of London, and the Sciences and Technologies for Music and Sound Research Lab at Ircam, CNRS, and Université Pierre et Marie Curie. This extension of our activities and ideas to the Asian hemisphere is, much as the Mexican extension, a remarkable step towards a worldwide presence of our Society.

Elaine Chew did not only co-organize the Singapore event, she is also the energetic initiator of the present MCM conference, taking place on 22-25 June-2015 at Queen Mary University of London. Together with Oscar Bandtlow, Elaine builds the general chairs, while David Meredith and Anja Volk are the programme chairs. We are looking forward to experience another exciting and innovative international biannual MCM conference with music in theory and practice. Thank you all for your unique energy and engagement!

Besides the JMM which continues to publish first tier quality papers, the second pillar of the MCM's publications, the Springer series for Computational Music Science, co-directed by Moreno Andreatta and myself, has been successful in publishing four titles: *The Languages of Western Tonality* (by E. Agmon), *Ubiquitous Music* (eds. D. Keller, V. Lazzarini, M. Pimenta), *Computational Musicology in Hindustani Music* (S. Chakraborty, G. Mazzola, S. Tewari, M. Patra), and *Computational Counterpoint Worlds* (O. A. Agustín-Aquino, J. Junod, Julien, G. Mazzola). A number of further titles are in contract with Springer, and we encourage the members of our Society to contribute to this series their original and innovative works.

I wish you continuation of all the creativity and persistence we have experienced since the Society's birth in 2007 and I hope that the great unification of math and music in whatever shape of thoughts and gestures will not occur too far from now. Thank you all for your efforts and enthusiasm.

Guerino Mazzola  
President, SMCM

## 2. Membership Renewal

This is a gentle reminder to renew your society membership and your subscription to *Journal of Mathematics & Music*. The first number of volume 9 (2015) has appeared, with six articles, the first issue under the editorship of Thomas Fiore and Clifton Callender. The yearly dues are \$50, or \$90 for two years. To renew, go to <http://www.smcm-net.info/registration.html>. If there are any subscription issues, please write me at: [clampitt.4@osu.edu](mailto:clampitt.4@osu.edu).

David Clampitt  
Treasurer, SMCM

### 3. The Journal of Mathematics and Music

At the Journal of Mathematics and Music, we have a few updates concerning the journal team, upcoming Special Issues, and a technical improvement.

Co-Editor in Chief Marek Źabka has decided to move on to other projects. We thank Marek for his incredible scientific and editorial work 2013-2014 and are pleased to retain his expertise as a member of the Editorial Board. We warmly welcome Clifton Callender as the new Co-Editor in Chief. Our long-term partner Katie Chandler at Taylor & Francis has also decided to move on to other projects. She had been with the journal since 2005, working in the roles of Publishing Editor, Managing Editor, and Publisher. We thank Katie for her engagement over the years, and we warmly welcome her successor Paul Naish to the journal team.

Special Issue programming for 2015 and 2016 is in good shape. The July 2015 Special Issue features the article “Tone Rows and Tropes” by Harald Friepertinger and Peter Lackner. The issue also contains an editorial, by Guest Editors Julian Hook and Robert Peck, and two introductions, by Andrew Mead and Robert Morris. The 2016 Special Issue on Machine Learning and Music will be guest edited by Jose Lñesta, Darrell Conklin, and Rafael Ramirez.

On the technical side, our main update concerns a simplification for authors. To ease the submission process and production of accepted articles, we hope to soon introduce journal-style LaTeX templates for articles and online supplements.

Please send us your excellent manuscripts, and recommend the journal to your colleagues, both as authors and readers. Proposals for future special issues are also welcome. We look forward to any feedback on the journal. As always, we thank authors, reviewers, and editors for maintaining the high quality of the journal.

Thomas Fiore and Clifton Callender  
Co-Editors in Chief, *Journal of Mathematics and Music*

### 4. The Society’s Next Biennial Conference

The **5th Biennial International Conference on Mathematics and Computation in Music** will be jointly hosted by the Centre for Digital Music in the School of Electronic Engineering and Computer Science, and by the School of Mathematical Sciences, at Queen Mary University of London on June 22-25, 2015. The organizing committee is comprised of Oscar Bandtlow and Elaine Chew (General Chairs), David Meredith and Anja Volk (Programme Chairs), Tom Collins (Publication Chair), Johanna Devaney (Panels/Tutorials/Workshop Chair), and Luwei Yang and Jan Sokolovskis (Communications Chairs). Details available at: <http://mcm2015.qmul.ac.uk/>.

#### Monday June 22

10:45 Introductions

11:00 Keynote

- Gareth Loy. *Steps to a theory of musical interest*

12:00 Lunch

13:00 Geometric Approaches I

• Robert Peck. *All-interval structures*

• Tobias Schlemmer. *Unifying tone system definitions: ordering chromas*

• Alexandre Popoff, Moreno Andreatta and Andrée Ehresman. *A categorical generalization of Klumpenhouwer networks*

14:30 Break

15:00 Notation and Representation

• Florent Jacquemard, Pierre Donat-Bouillud and Jean Bresson. *A structural theory of rhythm notation based on tree representations and term rewriting*

• Liang Chen, Rong Jin and Christopher Raphael. *Renotation from optical music recognition*

16:00 Break

16:30 Poster Craze I

17:05 Poster Session I

• Alexandre Popoff. *A statistical approach to the large scale structure of John Cage’s Number Piece Five*

• Eita Nakamura and Shinji Takaki. *Characteristics of polyphonic music style and Markov model of pitch-class intervals*

• Rafael Valle and Adrian Freed. *Symbolic music similarity using neuronal periodicity and dynamic programming*

• Johanna Devaney. *Evaluating singer consistency and uniqueness in vocal performances*

• Masatoshi Hamanaka, Keiji Hirata and Satoshi Tojo. *Structural similarity based on time-span sub-trees*

• Robin Laney, Robert Samuels and Emilie Capulet. *Cross entropy as a measure of musical contrast*

• Raymond Whorley and Darrell Conklin. *Improved iterative random walk for four-part harmonization*

18:00 Welcome Reception

#### Tuesday June 23

9:30 Keynote

• Andrée Ehresmann. *Approaching creative systems: insights from contemporary mathematics*

10:30 Break

11:00 Post-tonal Music Analysis

• Jason Yust. *Applications of DFT to the theory of twentieth-century harmony*

• Kate Sekula. *Utilizing computer programming to analyze post-tonal music: contour analysis of four works for solo flute*

12:00 Concert: Blood & Tango

13:00 Lunch

14:00 Poster Craze 2

14:35 Poster Session 2

• Christopher White. *A corpus-sensitive algorithm for automated tonal analysis*

• Gilles Baroin and Hugues Seress. *The Spinner-Tonnetz: new musical dimensions in the 2D network for tonal music analysis*

• Dimos Makris, Maximos Kaliakatsos-Papakostas and Emiliios Cambouropoulos. *A probabilistic approach to determining bass voice leading in melodic harmonisation*

• Brian Bemman and David Meredith. *Exact cover problem in Milton Babbitt’s all-partition array*

• David L Clappitt and Jennifer Shafer. *Greek ethnic modal names vs. Alia musica’s nomenclature*

• Katerina Kosta, Oscar F. Bandtlow and Elaine Chew. *A change-point approach towards representing musical dynamics*

• Ryan Groves. *Finding optimal triadic transformational spaces with Dijkstra’s shortest path algorithm*

## 15:30 Patterns

- Marcelo Enrique Rodriguez Lopez and Anja Volk. Location constraints for repetition-based segmentation of melodies
- Mathieu Giraud and Slawek Staworko. Modeling musical structure with parametric grammars
- Andrew J. Milne, David Bulger, Steffen A. Herff and William A. Sethares. Perfect balance: a novel principle for the construction of musical scales and meters

## Wednesday June 24

### 9:30 Keynote

- Emilia Gómez. *Computational models of symphonic music: challenges and opportunities*

### 10:30 Break

### 11:00 Music Generation

- Jaime Arias, Myriam Desainte-Catherine, Carlos Olarte and Camilo Rueda. *Foundations for reliable and flexible interactive multimedia scores*
- Carlos Almada. *Genetic algorithms based on the principles of Grundgestalt and developing variation*
- Tsubasa Tanaka and Koichi Fujii. *Describing global musical structures by integer programming on musical patterns*

### 12:30 Lunch

### 13:00 Deep Learning

- Stefan Lattner, Maarten Grachten, Kat Agres and Carlos Eduardo Cancino Chacón. *Probabilistic segmentation of musical sequences using restricted Boltzmann machines*
- Bob Sturm, Corey Kereliuk and Jan Larsen. *¿El Caballo Viejo? Latin genre recognition with deep learning and spectral periodicity*

### 14:30 - Film: Gilles Baroin and Hugues Seress

### 15:30 - Break

### 16:00 - Performance

- Guerino Mazzola and Maria Mannone. *Hypergestures in complex time: creative performance between symbolic and physical reality*
- Matteo Balliauw, Dorien Herremans, Daniel Palhazi Cuervo and Kenneth Sørensen. *Generating fingerings for polyphonic piano music with a tabu search algorithm*
- Luwei Yang, Elaine Chew and Khalid Z. Rajab. *Logistic modeling of note transitions*

### 17:30 Break

### 18:00 Concert: Geometries and Gestures (GEGE)

## Thursday June 25

### 9:30 Keynote:

- Ge Wang. The art of designing computer music

### 10:30 Break

### 11:00 Scales

- Emmanuel Amiot. *Can a scale have 14 different generators?*
- Marco Castrillón and Manuel Domínguez. *On the step-patterns of generated scales that are not well-formed*
- Thomas Noll. *Triads as modes within scales as modes*

### 12:30 Lunch

### 13:30 Geometric Approaches II

- Ozgur Izmirlı. *Constructing geometrical spaces from acoustical representations*
- Clifton Callender. *Geometry, iterated quantization, and filtered voice-leading spaces*
- James Hughes. *Using fundamental groups and groupoids of chord spaces to model voice leading*

### 15:00 Closing Address

## 5. News

### Academic Programs

The 20th Anniversary of the ATIAM Master Program (Acoustics, Signal Processing and Computer Science applied to Music), hosted by IRCAM and co-organized with UPMC and Telecom ParisTech was celebrated last December at IRCAM. It coincided with the lunch of the new structure of the Master which increases the International dimension. More information at ATIAM web page: <http://www.atiam.ircam.fr/>

### Awards

The 2014 **International Computer Music Association/Sound and Music Computing** best paper award was presented to L. Bigo, D. Ghisi, A. Spicher, M. Andreatta for their paper “Spatial Transformations in Simplicial Chord Spaces” (In *Proceedings of the ICMC/SMC*, 1112–9). This paper will be also published in an extended and revised version in the vol. 39, no. 3 of the *Computer Music Journal*.

### Conferences

The society co-organized the **International Congress on Music and Mathematics** in Puerto Vallarta, Mexico, in November 2014. Springer will publish the proceedings and details are available at: <http://icmm.cucei.udg.mx/>.

Guerino Mazzola recently gave a concert and the closing keynote talk at the **Improvising Brain II: Multiple Perspectives** symposium in March 2015. Details are available at <http://www2cas.gsu.edu/theimprovisingbrain/>.

### Distinguished Lectures

Thomas Noll, founding member of SMCM and former editor of JMM, will give the 2015 William Poland Lecture on the 27<sup>th</sup> of October at the School of Music of The Ohio State University.

### Publications

Bozhidar Bozhanov: *Computoer: “Rule-based, probability driven algorithm music composition”*. Available at: [https://www.academia.edu/9696759/Computoser\\_-\\_rule-based\\_probability-driven\\_algorithmic\\_music\\_composition](https://www.academia.edu/9696759/Computoser_-_rule-based_probability-driven_algorithmic_music_composition).

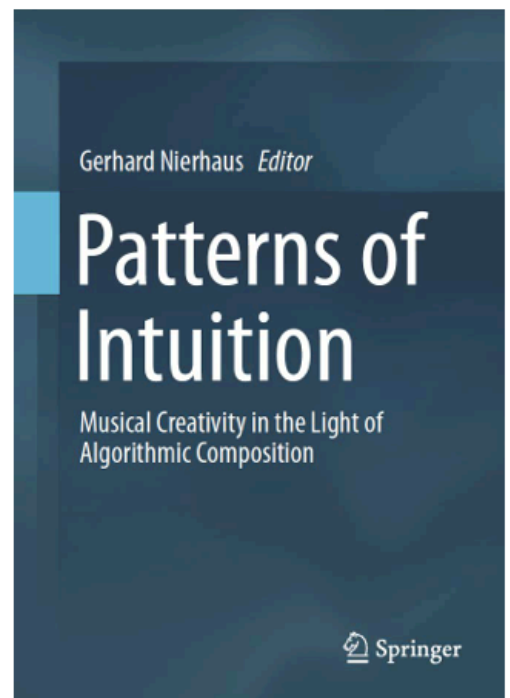
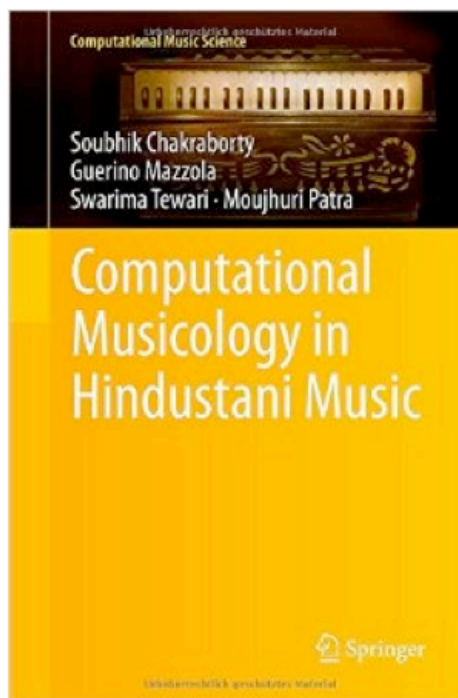
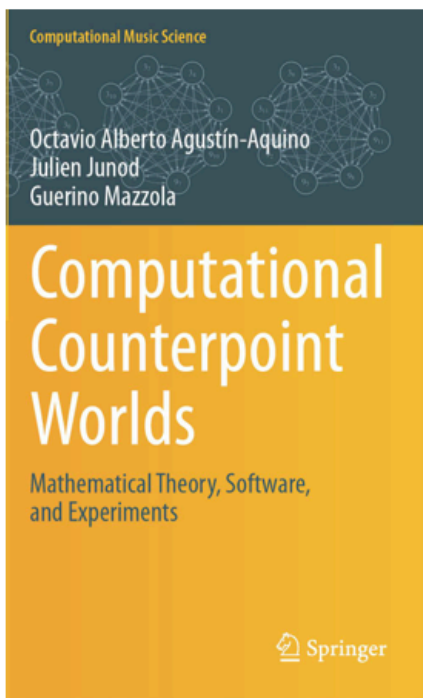
Thomas Fiore was awarded a Humboldt Fellowship to spend his 2015/2016 sabbatical at Regensburg University in Germany. There he will pursue topology projects with various collaborators and mathematical music theory projects with Thomas Noll.

Guerino Mazzola, Octavio Alberto Agustin Aquino and Julien Junod: *Computational Counterpoint Worlds*. Springer Series Computational Music Science, Heidelberg et al., to appear Spring 2015

Guerino Mazzola, Soubhik Chakraborty, Swarima Tewari and Moujhuri Patra: *Computational Musicology in Hindustani Music*. Springer Series Computational Music Science, Heidelberg et al. 2014.

Guerino Mazzola, Maria Mannone and Yan Pang. *Cool Math for Hot Music*. Springer Series Computational Music Science, Heidelberg et al., to appear Fall 2015.

Gerhard Nierhaus (ed.) *Patterns of Intuition - Musical Creativity in the Light of Algorithmic Composition*. Springer, Heidelberg et al. 2014



## About Us

The Society for Mathematics and Computation in Music (SMCM) was founded in 2006 as an international forum for researchers and musicians working in the trans-disciplinary field at the intersection of music, mathematics and computation. The SMCM is registered in the USA. At its inaugural meeting in Berlin, on May 20, 2007, 13 board members were elected, from which were selected the officers for the society. The official website of the Society can be found at [www.smcm-net.info](http://www.smcm-net.info).

To become an accredited individual SMCM member, please visit our online registration form at [www.smcm-net.info/registration.html](http://www.smcm-net.info/registration.html). Membership includes a print subscription to the Journal of Mathematics and Music, the SMCM's official journal. For full information on the Journal of Mathematics and Music, a publication by Taylor & Francis, including manuscript submission instructions, library subscription options, details on free email alerting services, editorial board information and the online edition, please visit its homepage at [www.informaworld.com/JMM](http://www.informaworld.com/JMM).

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