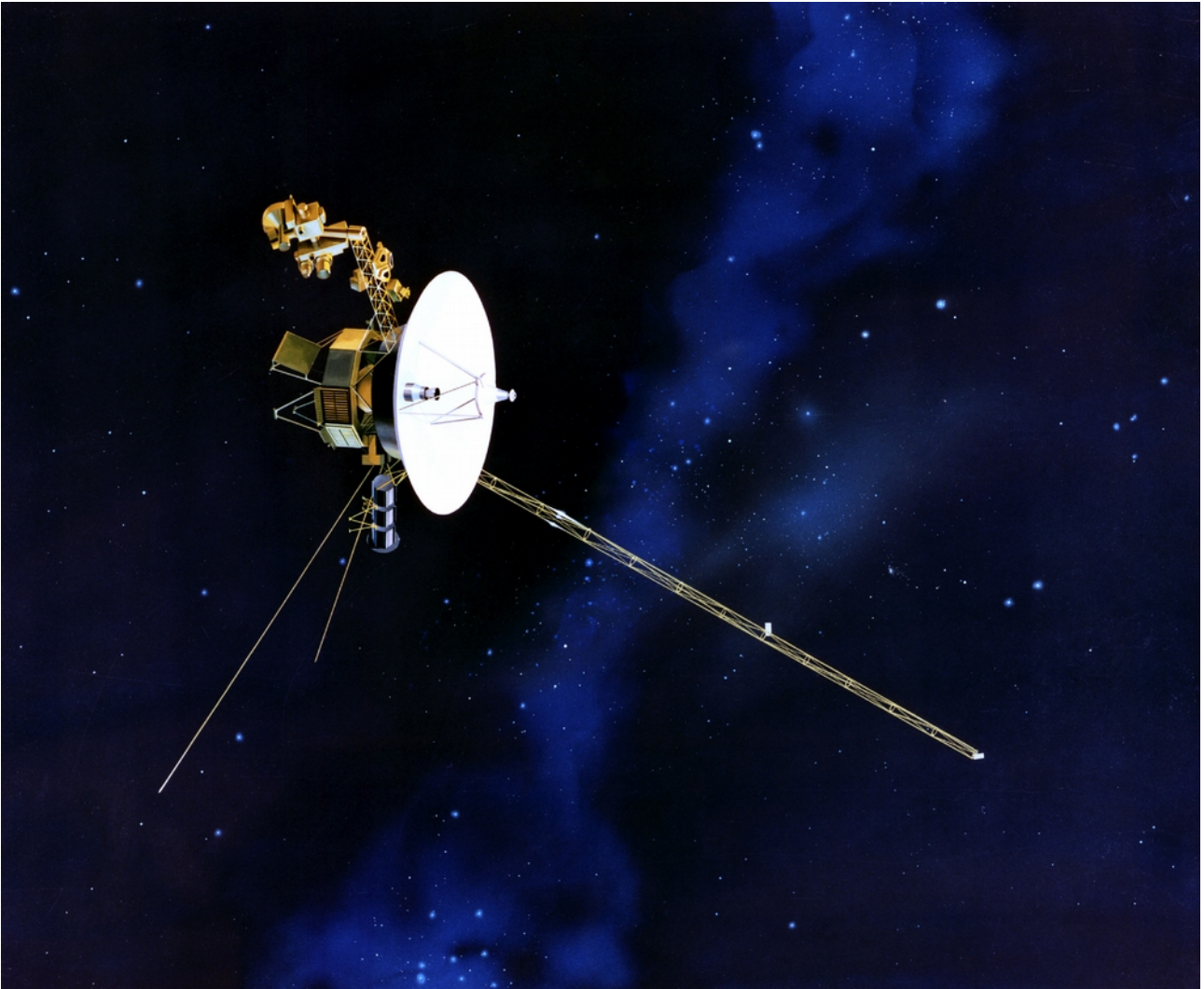


**WORKSHOP**

**Create your own music from (deep)space or wall street**

**by Dr. Valery Vermeulen**



Did you ever wonder how the universe would sound like if you could hear it, what sounds can be derived from our financial markets and if it is possible to make music with them and if so how this can be practically done? In this workshop you will learn all about it and much more.

Central theme of the workshop is how abstract scientific data such as for example data originating from (deep)space (emitted by various astrophysical objects such as nebula, pulsars, stars,... ) or data coming from financial systems can be used in an innovative way to compose, perform music or create multimedia installations. To this end the focus will be put onto the two creative practices that make this possible: data sonification and interactive sound synthesis. With data sonification we hereby understand the rapidly expanding field of transforming any given numerical abstract data into sound. Interactive sound synthesis on the other hand encompasses all synthesis techniques where the generated sound is being influenced by one or more external data sources.

This one day workshop is organized into two modules:

In a first module you learn to get acquainted with the basic principles of interactive sound synthesis

and sound design. Using the open source software platforms Pure Data and Reaper every student learns to build his or her own synthesizer. Subsequently he or she learns the different ways how to integrate an interactive component into the synthesizer that was build. As a student you will learn how to enable the synthesizer to be connected to various external data sources.

The second module of the workshop is based around the use of data for musical artistic purposes. You learn to work with various data streams (such as for example astrophysical, econometric streams or the data streams of your own interest). Subsequently each student learns how to transform these data streams in to artistically meaningful sound(scapes) and music using the right data sonification techniques. The techniques from the first module will serve here as a starting point.

All techniques and methods in this workshop are explained in a straightforward and practical way. In doing so this will enable each student afterwards to seamlessly integrate the knowledge he or acquired into the workshop into his or her own creative practice.

The workshop is open to everyone. Open to novices, curious minds, musicians, sound sculptors, artists, scientists,... No experience or technical pre knowledge required. All the concepts and methods in this workshop will be explained in a hands on and practical way.

Bring your own laptop and headphone

## References:

Links:

- <http://www.valeryvermeulen.net>: artist website of author
- <http://www.emo-synth.com>: website of the EMO-Synth project (link to project on algorithmic music composition, biofeedback and artificial intelligence by the author)
- <http://www.mikromedas.net>: website van Mikromedas project (link to space sound project by the author)

Literature:

- Puckette, M. (2007) *The Theory and Technique of Electronic Music*.
- Farnell, A. (2011) *Designing Sound*.
- Kreidler, J. (2009) *Programming Electronic Music in Pd*.
- Boulanger R. (2001) *The C Sound Book. Perspectives in software synthesis, sound design, signal processing and programming*. The MIT Press
- Welsh, F. (2006) *Welsh' Synthesizer Cookbook*
- Welsh, F. (2010) *Welsh' Synthesizer Cookbook, Vol2 (Harmonic Catalogue)*.
- Vermeulen, V. (2014) *Affective Computing, Biofeedback and Psychophysiology as New Ways for Music Composition and Performance*. In: eContact! 16.3 Toronto Electroacoustic Symposium 2013. Link:  
[http://cec.sonus.ca/econtact/16\\_3/vermeulen\\_affectivecomputing.html](http://cec.sonus.ca/econtact/16_3/vermeulen_affectivecomputing.html)

- Vermeulen, V. (2012) *The EMO-Synth, An Emotion Driven Music Generator*. In: eContact! 14.2 Biotechnological Performance Practice. Link: [http://cec.sonus.ca/econtact/14\\_2/vermeulen\\_emosynth.html](http://cec.sonus.ca/econtact/14_2/vermeulen_emosynth.html)

Software:

- Pure Data: <http://puredata.info/>
- Processing: <http://processing.org/>
- Audacity: <http://audacityteam.org/>
- Reaper: <http://www.reaper.fm/>
- TAL Free soft synths and audio plugins: <https://tal-software.com/Products>
- Voxengo free audio plugins: <http://www.voxengo.com/group/free-vst-plugins/>
- Synth1 free soft synth: <http://synth1.com/>
- Crystal free soft synth: <http://www.greenoak.com/crystal/Crystal/Crystal.html>

## About the teacher:



Dr. Valery Vermeulen is electronic musician, music producer, mathematician, new media artist, author and visiting professor at Erasmus University College in Brussels where he teaches on multimedia art and technology. In 2001 he obtained a Phd in pure mathematics at the Ghent University (Belgium) conducting ground breaking research in the field of algebraic group theory. Between 2001 and 2005 Vermeulen worked at the Institute for Psychoacoustics and Electronic Music (IPEM, Ghent University) on a research project focusing on the link between music and emotions. Meanwhile he started writing and recording music in my his own production studio. Since 2003 Vermeulen has been working on various interactive multimedia projects where the man machine interaction plays a central role. Topics in his work cover a broad range of disciplines including creative evolutionary systems, generative art, algorithmic sound and image generation, affective computing, artificial intelligence, econometrics, sound design, data sonification and music production. As examples of his recent projects we can mention *EMO-Synth*, *Krystal Ball* and *Mikromedas*. With the *EMO-Synth* project Vermeulen's work is situated in the area of interactive multimedia systems where automatically generated sound and music systems are directed by the emotional responses of the user (more info at: <http://www.emo-synth.com>). In the *Krystal Ball* project, an interactive multimedia system where the mechanisms that caused the financial credit crisis, stochastic and algorithmic music generation and the work of pioneer I. Xenakis play a central role. With his most recent project entitled *Mikromedas* (more info at <http://www.mikromedas.net>) focus is set on the innovative uses of data from space and deep space as new tools form music composition and performance. Vermeulen's installations and performances have been widely shown in Belgium as well as abroad. Locations and venues of where his work was shown include Slingshot Festival (Atlanta, US), TES (Wychwood Theatre, Toronto, CA), IMT (Institute for Advanced Studies, Lucca, IT), Technical Museum Zagreb (Zagreb, HR), BEAF (BOZAR Electronic Arts Festival, Brussels, BE), DEAF Festival (Dutch Electronic Art Festival, Rotterdam, NL), GOGBOT Festival (Enschede, NL), W139 (Amsterdam, NL), TEDxFlanders (TEDx, Antwerp, BE), Agora Collective (Berlin, DE), Liebig 12 Gallery (Berlijn, DE), Korrekt Gelände (Frankfurt, DE), GRETA Gallery (Zagreb, HR), MHKA (Museum of Contemporary Art Antwerp, BE), MHKA Media

(Museum of Contemporary Art Antwerp, BE), Musical Instruments Museum (MIM, Brussels, BE), Atomium (Brussels, BE), Beursschouwburg (Brussels, BE), Z33 (Hasselt, BE), STUK (Leuven, BE), Vooruit (Ghent, BE), Tour & Taxis (Brussel, BE), Happy New Ears Festival (Coutray, BE), artcinema OFFoff (Ghent, BE), Art Gent (Ghent, BE), Pecha Kucha (Ghent & Brussels, BE), DORKBOT (Ghent, BE), Royal Conservatory of Ghent (Ghent, BE), KASK Cinema (Ghent, BE), Gallery Tatjana Pieters (Gent, BE), on national radio channels KLARA, Radio1, Radio2 and Studio Brussels and national television channels Ketnet and TV Brussels. Besides his artistic and educational activities Vermeulen currently also works as a statistical expert and consultant and recently finished his studies as music producer at the Royal Conservatory of Ghent.

More info at <http://www.valeryvermeulen.net/>

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