

**Excerpt of email correspondence from scientist Art Olin to artists Giorgio Magnanensi and (LOoW researcher) Ingrid Koenig**

On 02/17/2017, at 12:32 PM, Art Olin wrote:

Dear Ingrid,

Giorgio Magnanensi and I met for about 1.5 hours on Feb 15. We had a wide-ranging conversation including my antimatter experiment - both abstract aims and concrete apparatus, the importance of instrument design in music and science, and sonification and expanding the boundaries of musical expression. We also discussed some aspects of experimental physics that naturally occur in the acoustic regime. I think we were both found this interaction interesting, and we expect to repeat it in April. Meanwhile, Giorgio has sent me some homework to study.

Regards, Art

## Giorgio Magnanensi • *Sound Crystals / -H* (2017)

Dedicated to Ingrid Koenig, Randy Cutler and Art Olin

*A microsonic environment for variable sound clouds, 1 yellow cedar flat audio resonator, 6 maple flat audio resonators and oscillographic videos.*

This work has been conceived and composed as a response to the dialogue and research involved in *Leaning Out of Windows* (LOoW), *Art and Physics Collaborations through Aesthetic Transformation*, an *Emily Carr University for Art + Design's* initiative funded by a SSHRCC Insight Grant in partnership with TRIUMF, Canada's national laboratory for particle and nuclear physics and accelerator science. The project was aimed to explore how artists might work with scientists to develop a shared understanding of how knowledge can be translated across their disciplinary communities.

The *artistic transformation* in *Sound Crystal / -H* is manifested in a sonically embodied form: an analogic translation, a symbolic rendering and a *poietic* environment. The variable sound clouds of microsonic chirps broadcasted through the wood resonators are produced as *sound crystals* modelled according to analogies with autoresonant chirps revealed while synthesizing antihydrogen. The original chirps range from 420 kHz to 360kHz at 60 MHz/s recorded as traces of vibrations of plasma clouds generated in the synthesizing process. Most of the sounds I synthesized are produced around a lower frequency range (4200 Hz to 3600 Hz) to allow for audible phenomena. The distribution arrangement of these sound textures happened in a temporal domain where I increased or decreased the duration of each micro sound while composing both vectorial and randomized variations of spectra, density, amplitude and duration.

The omnidirectional diffusion of the audio resonators further enhances both the ephemeral and the spatial metaphors generated in the creative process. Intuition is developing through various channels of sonic and spatial imagination. The resonating quality of the wood panels and their porose internal structure is also exploited to create a sonic environment, which has both spatial and physical qualities. Few mini amplifiers drive the sound into 20-Watts audio transducers applied to the lower rear of each resonator, exciting the wood panels and transforming their surface into a distributed-mode loudspeaker. Discrete to continuous microsonic objects, sound clouds and counterpoints of sine waves move and diffuse through the "*wood plasma*". In this way the audio is approaching an omnidirectional presence in the way the sound from the panels is dispersed evenly in all directions. Finally, the design of this sonic environment relies also on ideas of *clouds* and *plasma*, while on the level of mesostructures I worked with and around materials and ideas related to:

- traces
- chirps
- charges
- polarities
- sine waves
- clouds
- energy transformation
- artistic transformation