

# PRIX ARS ELECTRONICA COLLIDE@CERN OUTLINE PROPOSAL: CONTEMPORARY MUSIC THEATRE

*for soprano, actor, digital film media, 3D sound sphere*

## ■ STORY OF A CONCEPT



Our starting point was a desire to express true physics. Overwhelmingly it seemed, physics-derived art operates through a process of either submerged metaphor or historical treatment, often distorting the essential principles involved, which end up bent over like spoons in the bottom of a burglar's sack. Our idea was to steal the spoons cleanly. The pure physics of particles is itself so richly suggestive and dramatic and beautiful that we wanted to use art to express it. In essence, we wanted to make available to an audience *the poetry of particles as they sing themselves*.

From this developed very naturally the idea of a song cycle. We imagined it sung by a soprano, with a libretto describing particles in a language distilled directly from physicists.

We then started to think more about the setting of these particles, and specifically their setting in CERN. In particular we became interested in how, in the experiments in the LHC, particles undergo these terrifically high speed collisions, and shatter outwards in new forms, and disintegrate, and leave in their aftermath a trail of debris. And we thought about how it is only by collecting this debris of information that scientists start to reconstruct a story of what happened — a story of the past. This was immediately a very powerful idea for us as it is so evocative of the language of theatre itself. So we began to ask, what would happen if we performed this kind of experiment with a dramatic character — if we set up a catastrophe-level collision between a character and some particles, and used this as a process to start creating debris, and acts of reconstruction?

The result was the architecture for a story:

A man is undergoing radiotherapy upon his throat for laryngeal cancer. The collision with his life is necessarily immense, including, due to the damage to his vocal chords, the loss of his ability to sing. He is now in isolation convalescing in the Swiss Alps. From there he starts writing a series of letters — to his ex-wife, his daughter, old friends — and through this process he attempts to reconstruct the story of his past. Only the story keeps changing in relation to the present. The progress of the treatment (the particle collisions in the radiotherapy gun and in his throat), and the diagnostics surrounding it — all of which are future to that past — seem to be determining how it looks. The story is an assemblage, shifting according to the pieces of debris collected. At times it seems magical and full; at others awful and full of regret. And so the man finds himself in a struggle. Thinking over the collisions and relationships of his life, and trying to reconstruct, he is in essence seeking a form of reconciliation. He is groping for a way to fall back in love with it all — with life, with being, and with the way the universe unfolds. This unfolding, which ultimately will subsume his life, is at heart the physics of particles. They are singing themselves, and

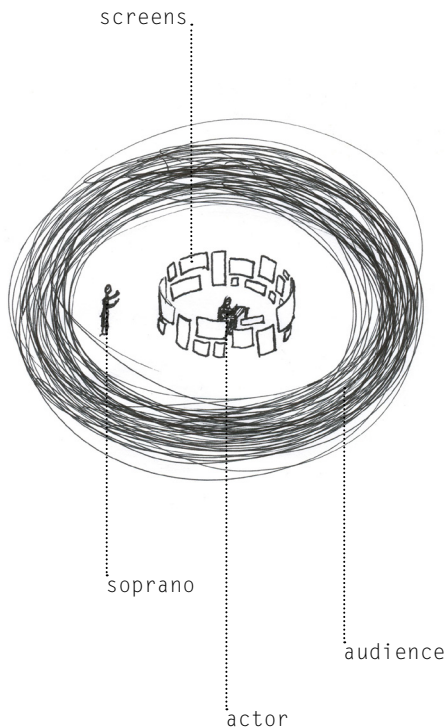
with that the history of the universe and his passage through it, just as they are being sung by the soprano as she turns her way through the song cycle. Having lost his own voice to sing, the story is one of him trying to hear the song cycle of the particles, and to fall back in love with it.

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Thinking about the universe, it is not entirely clear whether or not the question “why?” is within the realm of physics. Why the muon; why the speed of light constant — or not perhaps? “Why” may not be within the (legitimate) bounds of art either, but while scientists at CERN are pushing back the frontiers of our understanding of particles — and the ways in which human consciousness seems to interact with them — one thing art can do where physics stops is to explore how consciousness *feels* about it all. Much of the quantum universe is deeply surprising, and can in certain ways be challenging or even irrationally upsetting. At the same time it can also be very beautiful. As we learn more about the universe, we have also to learn how to live with it. Art can be a part of this learning process by expressing it beautifully.

Through this piece — with the song cycle, and the man with his letters — we hope to express something about how particles go about being particles, and how we as human beings can learn to love them.

## ■ PRESENTATION THROUGH DIGITAL MEDIA



To tell this story we conceived of a form of digital-media-live-theatre hybrid. In terms of staging, this takes the shape of an installation of multiple screens forming a circle that surrounds the man (an actor) as he composes his letters in isolation. The screens serve almost to obscure him entirely. However, on the screens are displayed live video feeds from various cameras trained on him from different angles throughout the space. Thus while he himself is mostly hidden, the audience watches him in real time from multiple simultaneous digital perspectives, as well as through glimpses in between the screens.

The live video feeds are manipulated and merged with prerecorded material such that they show a combination of his present, past and future, as well as imagined or fictional variations (all of which he is moving through in his letters and trains of thought). In parallel with this, the soprano sings her song cycle from somewhere outside the circle. She too however is captured on video, at times appearing on the screens in footage that is mixed visually with the feeds from the man.

This opens the possibility for the two characters to connect. For example, at one point the man may need to wash himself. In his weakened condition he has difficulty removing his shirt. From outside the circle, the soprano performs a series of careful movements in empty space. Captured on video and mixed with the video of the man, the screens show her gently helping him bathe. In this way, the delicate use of the digital interface allows the soprano to mingle very abstract with very human gestures. Indeed the living breath of the piece is caught upon this pane of contact between them. Subtle acts of reconstruction and hearing suggest for her a soft cascade of possible roles: the voice of the particles, an angel watching over him, the right side of his brain, the daughter to whom he writes ...

For the audience, the installation turns the experience of theatre itself into a process of reconstruction. The screens, with their fractured perspectives and merged time sequences, display a kind of multifarious debris of information, amongst which the audience likewise must collect pieces and string them together to form for themselves a story of the past. The nature of the installation ensures that according to where audience members are sitting, and therefore which screens they can see, and what glimpsed angles they have in between — as well as how they are choosing to think about all of this — will lead to different reconstructions. And so, in confluence with the material, the staging suggests multiple simultaneous stories to different vantage points. What is seen on the screens from one side of the space is not what is seen from the other, with each perspective leading to different information, narratives and ideas.

The digital media interface thus allows us to build up a layering of collisions and reconstructions: between particles and lives, events and characters, and between play and audience. These generate a series of different pasts and futures, by turns throwing out and collapsing alternative histories and possible paths through the piece. The result is a unique synthesis of live performance and live observation.

One of the things we have come to understand about both modern physics and modern drama is that events in space cannot be thought of as occurring in an “inert theatre”, and there is no single true “camera” through which to see things safely or definitively. Instead, the act of watching, and interpreting, is an essential component of what happens, as consciousness is somehow in-built into the mechanics of the theatre of spacetime.

The digital media installation offers a means to grasp these concepts head on, and use them at the core of the creative process.

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The piece seeks genuinely to explore the particle physics being investigated at CERN, and to make it human and moving in an imaginative dramatic form. The shape for the narrative — the man exploring different reconstructions for what his past might be, and the multiplicity of possible futures influencing it — is driven by the ideas of quantum mechanics. At the same time, the song cycle engages very directly with the research taking place at CERN, and serves both to illustrate and experiment with the concepts at play. The story is then communicated through an innovative use of digital media in both the staging and conceptualisation, and through music, which is perhaps the quintessential expression of the universe in the act of existing: a vibration through time in space to a consciousness.

The circular staging is ideal for presentation at the Globe of Science and Innovation at CERN, and can be readily adapted for performance at the Ars Electronica Festival.

## ■ LINES OF RESEARCH

### **Composition**

The essential concepts we are investigating hook directly into my way of composing music. I often use repeating and reconstructing elements as a compositional technique, and these also play into performance through literally combining live instruments and voices with sampled versions of themselves. A point of inspiration for this piece is to use space as an integral part of the composition, and to create a vast ring around the audience with sound. Music defines space, just as it can be a metaphor for it. The particle processes going on at CERN have a huge musical potential, and I am very excited by the opportunity to develop these ideas through the research residency.

— Arnoud Noordegraaf

### **Language / Narrative**

A particular point I am fascinated by is the way physicists at CERN actually talk. In my experience physicists tend to deploy a peculiar and very beautiful kind of language to describe particle behaviour and what are often essentially mathematical ideas, and an area of research for me would be to distil this out into the libretto. This would involve working closely with the scientists at CERN to develop the necessary understanding, and would be inspiring in a very direct capacity in terms of writing lines. But more than this, it would feed into a certain feel we want to infuse into the entire piece. The concepts outlined above provide an architecture for a narrative, but everything about the story, and who the characters are and the atmosphere of the Swiss setting, are things I would develop through absorbing the science and CERN itself into the writing process.

— Adrian Hornsby

### **Digital Media**

The opportunity to work with Ars Electronica Futurelab is hugely inspiring — enormously expanding the range of what we can do and the directions we can go imaginatively with the presentation of the piece.

Specific lines of experimentation with the visual aspects include: merging different live feeds (e.g. from the two characters) with each other and with prerecorded material; developing renderings and visualisations of physical processes; and manipulating live video using the rendering techniques developed. In addition to using the screens as individual displays we conceive of them working at times in combination — for example at points joining up virtually to form a semi-continuous ring of projected light. This could be used to create a kind of in-theatre virtual accelerator, with particles flying round, colliding, leaving trails, disappearing ...

A further and very exciting avenue of research lies in combining the 3D sound sphere in the composition with live video and virtual images. This implies the technical challenge of interlocking the spacial positioning of sound with multiple instances of graphics and live video streams. To give an example of how this may be used: particles swarm around the theatre as sound elements. After a huge collision they are left hanging — all tiny and glittering and still throughout the audience. The actor, seen by cameras from all sides, starts picking these pieces up and bringing them together in an imaginary shape in front of him. The screens show him live, while inserting a digital representation of the sound-particles he is collecting from the corners of the space.