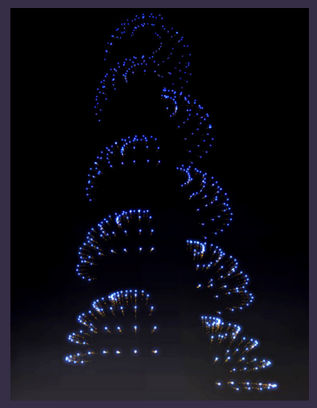
FA JOI

‘Glory is light, light gives joy and joy is the happiness of the spirit’

Antoni Gaudi

The pyrotechnic arts across the world create joy in three main ways: thrill , narrative and landscape splendour. The future of pyrotechnics must try to encompass all three.



Sky architecture with drones and pyro

The current CAA regulations preclude the mounting of pyrotechnics on normal commercial drones, but the FAA are now considering the use of pyrotechnics from drones for specific entertainment environments. We need now to make a new representation to the CAA to consider mitigating factors. These will include the use of ground powered and tethered drones already in use in search and rescue applications.

A key safety factor would be operating pyro drones within fixed GPS boxes, to create patterns static aerial firing platforms. These would operate with strict firing safety protocols based on height and orientation telemetry from the drone. This will enable aerial pyro effects to be specifically placed in relation to light drone figures.

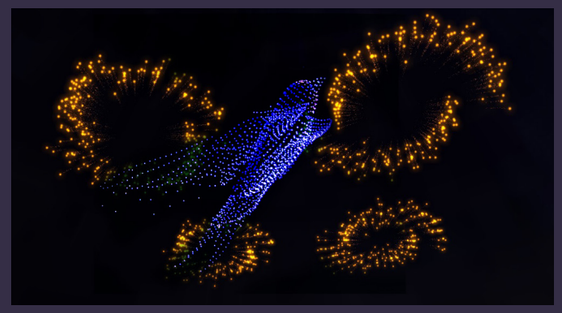
Drone mounted pyrotechnics can create an imaginary sky architecture. Where large iconic structures have been used for launching pyrotechnics these can be replaced in any open landscape with drone pyro launching platforms. Giant parasols of pyrotechnics could be launched from 1000ft high vertical arrays, or a checkerboard canopy can be created across a landscape. The creation of vast horizontal webs of pyrotechnics across a sky would be a completely new visual experience.

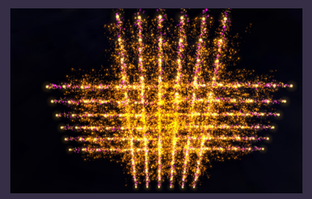
A combination of vertical stacking and a horizontal grid layout would enable the creation of fantastic aerial firing patterns, creating rings and polyhedral forms through which light drone displays could fly.

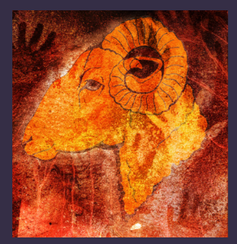
Already we can create landscapes for drone narratives using existing technologies with precise planning. Pyrotechnics can be used for the reveal of a drone image or for creating landscape features on which drone figures float or spin. We can also use light drones to create an aerial architecture for fireworks to be displayed within.

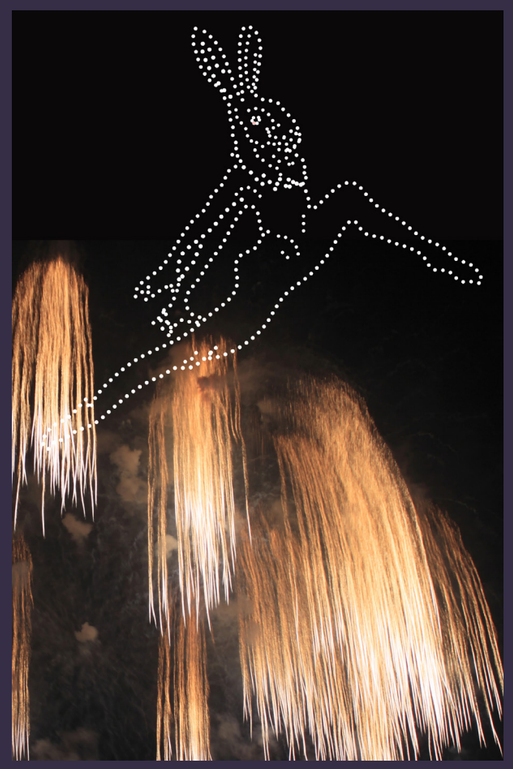
Bringing the audience together

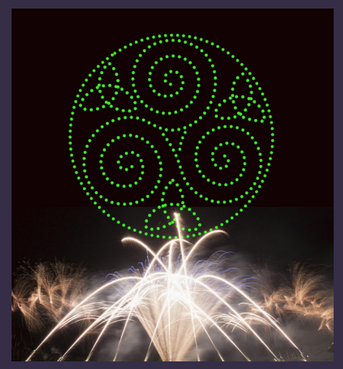
The thrill of taking risks and the joy of coming through it with others, will be created in a version of the traditional Correfoc. Working with a Catalan performance group we will create a fire run that groups can book to take part in during the two hours leading up to the main show. A track will be created using a combination of colder spark devices and some stage effects, that will allow the participants to feel under threat while any real risks are mitigated with some simple PPE and careful risk assessment. Viewing areas will allow nonparticipants to watch the run antics. The aim is to create a sense of shared experience to unite the audience.

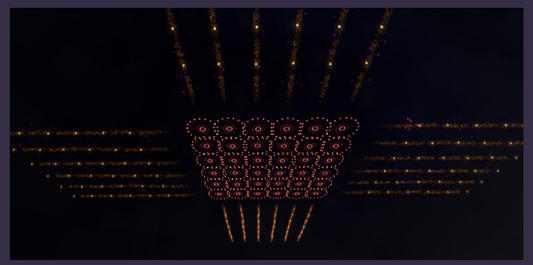


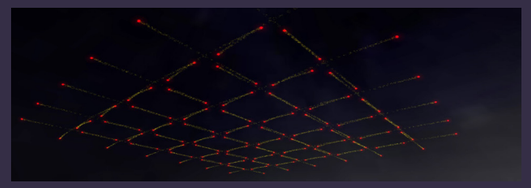












The Fifth Level

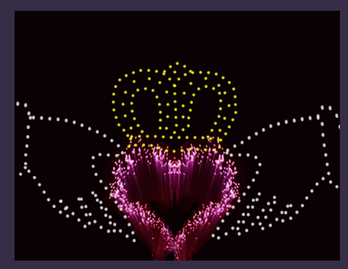
5 million years ago the Hominid lineage was born from a climate crisis and now it must culturally evolve to survive the next.

For 400,000 years humans have gathered around fire hearths for refuge and to share knowledge and stories.

The show uses all three forms of pyro narrative: the narrative of colour and form, storytelling and musical choreography. We will tell with simple iconic symbols and mythic figures the universal story of mankind from hunter gatherer, through farmer, industrialist and scientist, to the data revolution and the power of corporations and finally to our awakening to the stewardship of the planet and rebirth with new cleaner technologies driven by the growing power of AI.

In city centres this story will be told with large scale lantern profiles combined with Hologauze projection screens and close proximity pyro creating vertical patterns in firing arrays across the façade of the projection surface.

In larger open spaces such as rivers the narrative will be told with fireworks and drones using the two media in synchronisation, where the drones create large figurative images within a landscape of pyrotechnics, and the pyrotechnics are displayed within an imaginary architecture created by drones.



Reducing environmental impact

The ongoing initiatives to reduce environmental impact include; perchlorate and heavy metal reduction, low smoke lifting charges, air launching to remove lifting charges entirely and the removal of any plastic inserts. Some steps on this path, such as the introduction of air launch systems, could replace one environmental impact with another that is less obvious.

The primary use of fossil fuels in pyrotechnic shows beyond transport is in creating flame effects and some flame systems have now been adapted for biofuels.

It should be noted that the greatest environmental impact for most displays comes from transporting the audience to the display locations. Therefore choosing city centre sites for large public events, with good public transport links, will always be the most significant factor.

The greatest step as designers we can make to reduce our environmental impact is to fire less. Most pyrotechnic effects rely on burning metals to generate colour and light and those metals have to be mined and refined. We can reduce what we fire by choosing the highest quality products, which have the highest levels of symmetry, colour saturation and star duration. Improving these basic parameters leads to far greater visual weight. If we fire this beautiful product with precision and detailed planning through accurate 3D simulation, we can move away from mass over firing to moments of exquisite beauty or sky filling with precise positioning. If we then make the largest firework events multimedia presentations that can frame and focus attention on the pyrotechnics we use, we can significantly reduce the amount we fire.

Improved use of products requires better ballistics and better product knowledge to precisely place aerial effects. Products designed to reduce tumbling, smart shells with shell altitude and orientation telemetry, the introduction of rifling and driving rings and precise quality control on lift and mortars will all lead to greater conformity of performance. If we then rigorously test to accurately understand that performance in various conditions, we will then be able to truly integrate fireworks with other media.

Ultimately less product fired leads to less products of combustion, less transport costs in delivery and import, less use of chemical resources and less mining of metals.