ART on SCIENCE: 26 études

Science as the catalyst for artistic expression /
Art as the catalyst for scientific observation

Art on Science: 26 études is an international art project commemorating the 60th anniversary of the sister city relationship between Boston, Massachusetts and Strasbourg, France. As centers for art, science, commerce, and education, the two cities share a rich history of cultural exchange.

This collaboration, sometimes simply called “AS26”, was created by 26 artists and 26 scientists, half from each city. The concept was to produce two art portfolios based on scientific themes and to pair each artist with a scientist who would provide a written commentary about the art. One portfolio will be exhibited in Boston and the other in Strasbourg. The proceeds from artwork sales will be used to support future exchanges.

Artists and scientists share much in common: they observe, they evaluate, they interpret. The fields of art and science have cross-pollinated for centuries, as artists document discoveries and scientists provide new ways to view the world.

For this project, scientists made studio visits and artists toured laboratories. Sharing resources and ideas, some pairs worked shoulder-to-shoulder in the lab while others collaborated virtually. Our topics ranged from the plight of the coffee bean to the grandeur of the cosmos. AS26 provided a forum for participants to deconstruct their disciplines and find commonalities. The connections forged were a testament to the power of curiosity and creativity.

A selection artwork and text from the project:

Alain Eschenlauer
Meandrina filograna
Technique mixte: Acrylique, encre et fil

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Marie Meister
Biologie
Musée Zoologique de Strasbourg

I am a biologist and have spent many years studying immune mechanisms. However, some 13 years ago I moved to the Zoological Museum of my city to take care of its collections, where I work now for the preservation, inventory and promotion of its impressive scientific heritage which has accumulated over some 250 years. This collection reflects both the unquenchable curiosity of Homo sapiens towards the natural world that surrounds us, and our inclination to destroy it since many of our specimens correspond to extinct species or to species that are threatened by our deeds.

I am always surprised to witness how much these inert artifacts, relics of lost lives, attract numerous artists, photographers, painters, sculptors who try to capture their substance through their work.

My daily environment in the Museum thus combines the two facets of our human civilisations, namely Science and Art, which to my eyes somehow compensate for part of our globally deserved stigma. Science because it drives humans to try to unravel the world in which they have evolved, the infinitely small, molecules, living cells, organisms, natural environments, planet history, but also space, planets, galaxies, the infinitely large, and all the laws that govern these various elements. Art, because it sublimates its beauty and helps us to forget briefly, or on the contrary to realise, that everything around us entails a death inherent in its very existence.

Alain chose to illustrate Cnidaria by picturing a stony coral and a gorgonian, both belonging to groups of magnificent marine organisms which are today threatened by unrestrained human activity. The Cnidaria phylum that evolved some 600 million years ago are animals exhibiting a characteristic radial symmetry that is easily observed in hydra and in jellyfish. Many cnidarian organisms have, however, developed a colonial lifestyle and for this they build calcite or protein structures that are often delicate, sometimes formidable. They are the exoskeletons that harbour the polyp colony and they make up the architecture of the so-called coral reefs which are hotspots of marine biodiversity. Reef coral cells contain single-celled dinoflagellates with which they live in symbiosis. Through their photosynthetic activity, these algae provide corals with organic carbon products and energy. They are the cells that are expelled from coral polyps because of global warming and pollution of tropical seas, which trigger massive coral death and thus lead to ‘coral bleaching’.

Alain wants to illustrate corals that are undermined, a stony coral gnawed at by the white leprosy that is going to doom it, a gorgonian with altered lacework. The artist intends here to challenge the visitor and to confront him with the consequences of our lifestyles, by using powerful displays of eroded beauty, which do not need explanations.

Ann Forbush
Annotated Ocean AS26 1
Monoprint with collage

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Sallie Chisholm
Institute Professor
Civil and Environmental Engineering
Department of Biology
Massachusetts Institute of Technology

I am a biological oceanographer. I study life in the oceans and how it interacts with ocean chemistry and the atmosphere. More specifically I study planktonic microorganisms that form the base of the food web, the phytoplankton. My lab is focused almost exclusively on the study of a tiny microbe called Prochlorococcus which dominates vast ocean regions and is the smallest and most abundant photosynthetic organism on the planet. Through photosynthesis, it converts as much carbon dioxide into living matter each year as do all the crops on land. This amazing little powerhouse was discovered only about 35 years ago.

When I look at this work of art, which includes renderings of phytoplankton, I see beauty. I see change. I see large and small. I see the footprint of humans, and our tendency to think of nature as we know it as the way it has always been; the ever-shifting baseline of what is “natural” is opaque to us. Unlike ancient structures, hieroglyphics, or transcripts, ancient ecosystems cannot be observed. They live only in our imagination. Like works of art, they are self-assembled masterpieces built from the complex interplay between the living and non-living world. But unlike most works of art, they are ephemeral.

The scientific method and the creative process appear at first glance at odds with one another. But are they? The scientific method begins with a hypothesis that can be tested – either through manipulative experiments or observations of patterns in nature. This is science’s way of knowing. It involves a roadmap. The creative process seems to begin with a blank slate. The artist’s inspiration can come completely from within, or be triggered externally. But there are no rules; there is no roadmap. Once begun, art can go in any direction. Not unlike a scientific experiment!

Hafid Mourbat
Empreinte Digitale
Gravure avec des caractères mobiles de typographie

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Christine Keyser
Génétique
Universités à la Faculté des Sciences

As a University Professor at the Faculty of Life Sciences of Strasbourg, I teach genetics to undergraduate and graduate students. At the same time, I conduct research on the genetic characterization of individuals from ancient funerary sites to better understand the history of past human populations. I am also an expert in forensic science and assist judicial investigations to confront suspects or establish the identity of previously unidentified people. This field of research may seem rather far from art, but many artists have been able to draw inspiration from the genetic profiles established to characterize an individual and to make them into unique original works.

I particularly liked the artistic work of Hafid Mourbat because it evokes fingerprints which have been used since the beginning of the 20th century in criminal sciences to create a file, then search for a suspect and identify them. We worked together to emphasize the importance of genetics in forensic investigations over the last thirty years. In fact, genetic fingerprints make it possible to identify an individual from deoxyribonucleic acid (DNA) contained in the cells of the human body; they are an alternative or indispensable complement for investigators when the digital traces are absent from a crime scene or unusable.

The colored plate of Hafid Mourbat symbolizes for me the variability or genetic polymorphism that exists between individuals and that makes it possible to distinguish them from one another. In fact, each individual is unique, and the technique of genetic fingerprints makes it possible to reveal this uniqueness of the individual and to use it in a judicial context. The second board of Hafid MOURBAT represents, in my opinion, an original fingerprint since it consists of a sequence of characters (and not crests and dermal folds), into which have slipped DNA sequences. Indeed, the genetic information that characterizes each individual is encoded in DNA, thanks to 4 bases which are Adenine, Thymine, Cytosine and Guanine (symbolized by the letters A, T, G and C). The sequence of these 4 bases (or letters) determines a DNA sequence that can be specific to each individual. The work of Hafid Mourbat houses the two small sequences “ACGTCTTGCAATGATTACCTAGGCAAAC” and “CCTCACTTGTAT” as a nod to the fingerprint.

In addition to being highly significant in my view, these two works are both contemporary and timeless as they both symbolize the imprint that Man leaves upon History.

Jan Powell
Something Vanished 1
Monoprint, phototransfer, intaglio, hand-coloring

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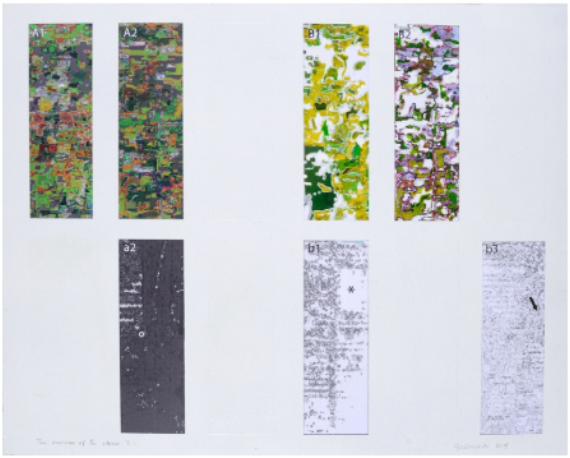
David Kaplan
Stern Family Professor of Biomedical Engineering
Tufts University

I am a biomedical engineer. I study two things: growing human tissue in the laboratory for the study of disease, and tissue damage and regeneration in search of insights and treatments. One of our areas of focus is the human brain and brain-related neurodegenerative diseases, including Parkinson's Disease and Alzheimer's Disease.

My associations are at many levels, both personal and professional…personal, because I lost my mother to Alzheimer's about a year ago, and professional, because laboratory study promotes new understanding and opportunities for treatment. Jan Powell's piece captures all of this. It shows the personal side of the 'lost and vacant' and somewhat 'pained' aspects on the faces of the individuals in the art, reflecting the unfocused, frustrating and mysterious nature of the disease. Professionally, you can see a small part of what we study in the laboratory as we try to find new strategies for treatment. The melding of these two areas into this one piece leaves one feeling almost as an Alzheimer's sufferer might feel.

Although similar in outcomes, the two methods rise from very different starting points. While the scientific method often starts out with a more directed hypothesis, the end result often takes directions you can not prepare for, which is a good thing. The artistic process may or may not start out with a specific goal, but usually ends up with a visual that can be interpreted in many different ways depending on the viewer's experiences and viewpoints. Thus, both methods are powerful and both of them open doors.



Gabriel Micheletti
Le murmure des pierres
Impression et acrylique

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B. Lapointe (PhD) and G. Micheletti (MD)
Ingénierie du son
ARTE

The State of the Art

Many acousticians work on the sound background of the seabed. The recent technical evolution has brought a dramatic improvement in the quality of the recordings done in situ which has allowed us to recognize their animal or vegetal origin. However, among these sounds, some can only be explained through a mineral origin. The work that we present is in favor of this hypothesis.

Material and Methods

We have developed a very powerful tool, “The diff erential hydrophone” which allows us to record the sounds emitted in an aquatic environment using an acoustic horn immersed in water with an ultra-powerful computer. It is equipped with “Pepito Sound” soft ware, modifi ed according to the Schmoldt-Livingstone equation and coupled with “Chromatic Castafi ore” soft ware, making it possible to transform the oscillatory immateriality of sound into colored signals one can analyze with the naked eye. To avoid impacting the carbon footprint of the planet, we performed our experiments nearby in The Schnokeloch, a stream in the Vosges. In February, 2018 we recorded and identifi ed sounds emitted in the creek bed at “The Waterfall of the Beardless Green Dwarf ” at 48° 3’ 38” N latitude and 6° 39’ 39” E longitude. The recordings were made between midnight and 3 am, when ambient sound is the least detectable. Despite a few disappointments, this option proved judicious. (1)

Results

Results are presented in the poster: 1) Conditions a / A: the cascade is at full fl ow. The lower part of the poster (in black and white) displays the diff erent recording spots (a1, a2 and a3). The chromatic transcription of the corresponding sound environment can be seen in the upper part of the poster (A1, A2 and A3). 2) Conditions b / B: the waterfall is drained and cleared of vegetation aft er diversion of the course upstream. The lower part of the poster (in black and white) displays the diff erent recording spots (b1, b2 and b3). The chromatic transcription of the corresponding sound environment can be seen in the upper part of the poster (B1, B2 and B3).

Discussion

Aft er diverting the stream and draining the waterfall that had been cleared of vegetation, we observed the persistence and modifi cation of the chromatic transcription of the residual sound environment. The stones are the only elements which can be responsible for the residual sound environment. Th is brings the irrefutable proof of sound activity – imperceptible to the human ear – due to the stones. Th is is what we call “The Whisper of Stones”.

James Zall
Lateral geniculate nuclei
Photograph (diptych of double exposures)

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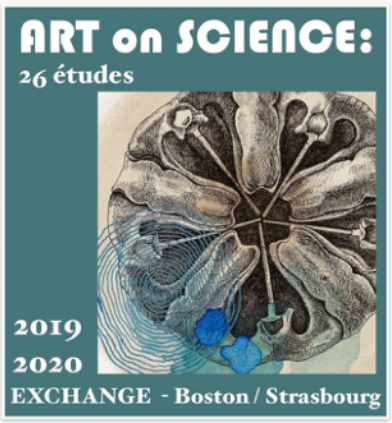
Mriganka Sur, FRS
Newton Professor of Neuroscience
Massachusetts Institute of Technology

I am a neuroscientist who studies brain mechanisms of vision. My laboratory examines: 1) how connections between neurons or brain cells of the cerebral cortex enable the brain to process visual information 2) how these circuits develop 3) how the visual environment influences their development. Alongside, we build new technologies to record and image the electrical activity of neurons, and computational methods to analyze them.

James Zall has created an artwork that both highlights and challenges our understanding of visual objects and space. Our brain crafts a unified view of the visual world from many separate views as our eyes dart from one part of a scene to another. By overlaying multiple exposures of different parts of a building facade, James highlights the fragmentary nature of vision. By weaving in rules of seeing, such as arches that provide continuity and window frames that capture lunette-like detail, James binds the image together. By juxtaposing pillars, brick walls, and octagonal lattices, with varying contrasts and highlights spanning a diptych resembling a stereogram, James challenges our notions of perspective. To me, the image brilliantly captures the complexity of vision.

James expertly utilizes his camera and even subverts its controls to take multiple exposures on a single film or digital frame. I was trained in engineering, and I deeply appreciate the intertwining of James' art and technology – something that marks my own research, as well. Understanding how the brain works involves multiple levels of analysis, similar to creating and interpreting expressive art. My research often dwells in detail, focusing on narrow, seemingly fragmented questions that require stepping back to bind together and unify. And we scientists also first imagine in our mind the answer to a question and later examine it by experimentation, ultimately crafting new ways of seeing nature.



Artists	Scientists
Alain Allemand	Gisèle Haan-Archipoff
Association Apog	Sylvie Rimbert
William Chambers	Jonathan Garlick
Elli Crocker	Peter Williams
Daniel Depoutot	Hervé Pelletier
Alain Eschenlauer	Marie Meister
Jesseca Ferguson	Jean Huang
Diane Fiedler	Vladimir Ivkovic
Ann Forbush	Sallie Chisholm
Aude Gilger	Philippe Lavalle
Jane Goldman	Howard Smith
Jean-Louis Hess	Michel Grosmann
Ronni Komarow	Gail Monaghan
Sandra Mayo	Jane Snyder
Christophe Meyer	Françoise Moos
Gabriel Micheletti	Bernard Lapointe
Hafid Mourbat	Christine Keyser
Ted Ollier	Irene Georgakoudi
Colleen Pearce	Sandra Shefelbine
Régis Pirastru	Uriel Frisch
Jan Powell	David Kaplan
Michelle Samour	Colin Orians
Danièle Schiffmann	Françoise Moos
Christian Voltz	Philippe Lavalle
Benjamin Walker	Jean-Luc Souciet
James Zall	Mriganka Sur