**Artistic residencies in scientific institutions**

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In early 2013, sound artist Bill Fontana arrived at the European Organization of Nuclear Research, more commonly known as CERN. His intention was to head down into the underground tunnels beneath the sprawling campus where, 175 metres below ground, the Large Hadron Collider circled and swooped beneath the French-Swiss border. When faced with the most powerful particle accelerator ever built, Fontana attached accelerometers to capture the sounds of the machine.

Applying to be artist-in-residence at the world’s largest particle physics laboratory was a no-brainer for Fontana, who has spent his forty-five year career exploring the physics of sound. The machines were a pull, but so too were the people. CERN is home to over 14,000 staff and visiting scientists, whose expertise and interests allied closely with his own. ”I feel the language and concepts I’m working with don’t comfortably fit within the normal discourse about art and aesthetics that you sometimes find people in the art world are in”, he explained, describing the “What? You’re doing what?” looks he’d received from curators when trying to explain the technicalities of his work.

CERN offered a space where, for a few months, he could be part of a community where his concepts could be easily comprehended and his ideas realized; a space where physicists and engineers “easily understood the tools I was using and how I was using them, so I could ask a lot of questions about what I wanted to achieve. I just couldn’t have that kind of dialogue in an art context.”

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C.P. Snow’s famous 1959 lecture on the antagonistic “two cultures” of arts and science has been hauled out and misunderstood so many times that it tends towards the threadbare. Yet it continues to raise a valuable point. Whilst there are huge overlaps between the forms of creativity, approach, and knowledge found across science and art, powerful structural factors continue to separate them into distinct institutions and communities. Education streams force specialization for both, with the sciences demanding a long and difficult training period of narrowing focus, and enculturation of workers. The scientific research institutes which arose across Europe and the United States from the early twentieth century onwards reinforced the walls of these silos, catering to the newly emerging scientific profession whilst gathering in large chunks of government and private sector funding, and channeling their focus into large-scale, often collaborative research work. Power in the arts, meanwhile, is often concentrated in private patrons, whose numbers have been swelled recently by international technology companies; and large institutions, such as museums.

The walls might be too big, solid, and established to be torn down, but small passageways can sometimes be built to tunnel up into science institutions, bringing in small groups of envoys from the arts. With the Collide@CERN residency program, Ariane Koek has built one such route in. Following sixteen years as a cultural producer for the BBC, Koek was awarded a Clore Fellowship in 2008, which included a three-month attachment to an organization of her choice. Koek mulled over where she wanted to go, realizing that what motivated her were the places where new ideas and knowledge were forged. Science, she said, is one of “those great breadboxes of ideas”. There was only one place which would encompass it all; and she promptly pulled together a twelve-page pitch to CERN, offering to conduct a feasibility study for an artist residency program. She sent it off and was shortly received a phone call saying “This is amazing—when can you start?” A fortnight later, in August 2009, Koek flew out to Geneva to begin planning.

How does one bring artists into science institutes? There is no one type of ‘science.’ Fields such as particle physics, molecular microbiology, or volcanology behave in very different ways, with distinct focus, funding streams, and culture. At CERN, Koek’s first task was to unpick just how the institute operated. She looked hard at its mission statement, its strengths and weaknesses, and the space of the campus itself. She also dug deep into the culture of particle physics itself, identifying both what she describes as the “endless curiosity” of its scientists and the demands of the field for collaborative consensus in order to move forward.

What she developed was a program strictly—severely—tailored to the textures of CERN. To tend against the institute’s size, artists were partnered with a scientist ‘buddy’, handpicked by Koek to spur stimulation and provide a friendly face. The pair gave a lecture at the beginning and end of each residency to make their presence legible in a sea of thousands of staff. Residencies were kept short, at three months, to offer what she calls an “injection of time” where artists could discover and explore their institute, but not so long that they lost their sense of self and practice. “There comes a point”, Koek explained, “where artists fall in love with particle physics so heavily that they want to become a particle physicist, and it takes fifteen years to become [one] so you’re on a highway to nothing. For me, that’s totally dangerous because the program I was creating was not about describing or illustrating particle physics—that’s a different form of art.” Instead, the space and people of CERN inform the ‘interventions’ that the artists make. During his residency, Fontana captured two types of sonic material: one drawn from vibration sensors placed on the large particle accelerators, the other from sound recordings from the lab where sound is used to monitor the integrity of particles. As part of this, Fontana brought loudspeakers down into CERN’s underground tunnels and looped the sound of the Large Hadron Collider back on itself. These recordings were gathered together into his final piece, *Acoustic Time Travel*, which explored his core ideas around mapping sound, and how sound travels across long distances and at different speeds. His earlier fantasies of creating a live performance sound piece in the tunnels unfortunately failed to come to fruition as it ‘just didn’t seem like a very practical thing’.

The notion of the scientific institute as site of inspiration through the residency program at the Search For Extraterrestrial Intelligence Institute. SETI, as it is more commonly known, is a non-profit organisation whose mission is to explore the origin and nature of life in the universe. Its residency program is young, founded in 2011 following a chance encounter, and subsequent camping trip at the Hat Creek Radio Observatory, between multimedia artist Charles Lindsay and SETI astronomer Jill Tarter. Linsday acts as founder and curator of the program, and, for the past three years, its first test-subject. Although substantially smaller than CERN, SETI also offers an array of complex instruments and inquisitive scientists for artists to engage with. Lindsay has spent time in the world’s largest wind tunnel, running sonic experiments; and built a collaborative working relationship with astronomer Laurence Doyle, a fellow hybrid practitioner whose interests, like Lindsay’s, straddle disciplines and skillsets.

The challenge, Lindsay says, comes in wondering how to approach SETI’s work when “the ideas that the astrosciences present are so big and so complex, like Kepler images. What the hell does an artist have to add to that?” (Koek mirrors these sentiments, describing how some Collide@CERN residents have “freaked out” at the enormity and complexity of particle physics). For Lindsay, time with Doyle and field-visits to the Bolinas RCA morse code station informed the development of his residency work, *CODE Humpback*, in which he transmitted and received two coded messages, ‘What do the whales say?’ and ‘All you need is love’. Lindsay describes the piece as a “SETI-esque work” which explores themes common to the institute’s mission: encrypted messages, inter-species communication, and non-human intelligence.

Like Koek, Lindsay intends the SETI program to support open-ended exploratory approaches; neither are keen on artists proposing highly detailed ideas of outputs. “If the artist said, this is what I’m going to build, this is what it’s going to look like, and 16 months later it looks like that—that’s not interesting”. Both actively steer their residencies away from work which simply mirrors and reinforcing the practices and outcomes of the host institutions. As he developed the program, Lindsay recalls how he was approached by SETI scientists who said, “Great, so you’re going to get someone to help illustrate my work?” That, he explained, is “something else entirely. It’s not a judgment call—there’s unbelievable astro-animation out there, but that’s not what we’re talking about”. Koek, who fundraises for each individual resident, acknowledges that her life would be easier if the residents simply illustrated or described CERN’s work, as it would allow her to pull in money from a communication or outreach budget. But the exploratory quality of the residencies is a political statement, mirroring the institution itself. “We’re too product driven and outcome driven in our society”, she says, “and CERN is one of the last places on the planet which believes in fundamental research”.

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Science institutions may have many motivations beyond outreach and public engagement when they set up residency programs. Yet the ‘impact agenda’ looms large over UK higher education institutes, requiring those who receive public funding to show that their research benefits people beyond academia. Dr John Paul, a microbiologist at Brighton University, has worked with performance and visual artist Anna Dumitriu for the past decade. He is emphatic that their collaboration goes beyond an exercise in ticking boxes around public engagement for winning big grants. Both, however, are keenly aware that if science institutes want to work with artists, framing the role in this way can be one route in. As Dumitrui recalls, “I caught JP saying something to the *Guardian* once, ‘Well, you have to do public engagement in science now’, and I said, ‘Why are you saying that? Don’t say that!’ and he said ‘But what I mean is, it’s the perfect excuse’”.

Dumitriu had worked alongside Paul for several years before they formalized—and found funding for—the relationship, through the Modernising Medical Microbiology (MMM) project. Wholly self-trained in microbiological research techniques, Dumitriu had initially turned up at his laboratory and asked if she could spend time there occasionally—he agreed, and the pair reached what Paul describes as a “gentleman’s agreement” around her use of desk space and equipment. By the time MMM began in 2009, the lab had got used to her presence: “It didn’t take an awful lot of effort to accommodate her, and it was a pleasant distraction having her in”, Paul says. When the MMM steering committee met a year in, the issue of public engagement arose. “You need an artist-in-residence” Paul told his colleagues, “they can get a message into parts of society we can’t otherwise reach”; and Dumitriu was promptly allocated part of the project grant to see what she could come up with.

Dumitriu is clear that her practice goes beyond communicating ideas to creating art that engages in ideas around the sublime, and the differing roles of art and science. Her time with MMM has given rise to work including *The Romantic Disease* which explored mankind’s relationship with tuberculosis through superstitions, antibiotics, and whole genome sequencing. This work has been publically facing, encompassing exhibitions, ‘open lab’ workshops, and symposia, offering a comfortable way of engaging wider audiences which goes beyond the scope and capabilities of her laboratory-based colleagues. “We wouldn’t have a clue how to engage people in that way” Paul says, “and we wouldn’t want to. By and large scientists are not the sort of animals who want to get out there in front of an audience, and be known outside their own community”.

Residencies can also be used as a form of public engagement which unpacks the social relevance of scientific research. The Wellcome Trust, a charity focused on biomedical research, set up the ‘Art in Global Health’ project explicitly to meet its own aims to engage diverse audiences around the questions that medical science raises for society. The program offered six residencies which ran between 2011 and 2013, set up across Wellcome’s existing network of research centres in locations including Bangkok, Malawi, and South Africa. The program’s intention was, curator Danielle Olson says, to “tease out some of the more personal, philosophical, cultural, and political dimensions of health research.”

For ‘Art in Global Health’, biomedical research was at the heart of the residencies. Artists were given a wide brief to find out about the research; and interact both with scientists, team members from other disciplines, and other communities. By being spread across deeply diverse sites, the program also highlighted the variant social contexts in which scientific research takes place. Thai physical theatre company, B-Floor Theatre were, Olson explains, “were keen to work in theatre and in overcoming language barriers”. Their work involved the exploring research into Malaria and other tropical diseases at the Mahidol University-Oxford University Tropical Medicine Research Programme (MORU), on the Thai/Myanmar border, where nine different languages are spoken by refugee communities. Their final work was a performance piece, *Survival Games*, which explored issues around meliodosis, a major yet little known infectious disease in Thailand.

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What then of the scientists themselves? Artists-in-residence can allow scientists to see their own work, and workplaces, differently, whether giving them a sense of the true scale of their collaborative work; or, through partnering with the artists themselves, providing access to new and unseen parts of their facilities. A theoretical physicist, Koek explained, might never otherwise go underground into the deep tunnels where the Collider nests. Bill Fontana’s work allowed CERN engineers to hear the voices of the machines that they worked with every day in a way which no-one had ever heard before which was, he says “really exciting”. Dumitriu’s laboratory colleagues also appreciate her presence both as a counter to the solitary nature of their own work, and to jar them into more lateral and creative ways of thinking. Similarly, Lindsay also sees the SETI residency program as a way to broaden the horizons of the institute’s “super-smart, super-curious” people about contemporary art.

“We’re like social workers, coming in an supporting the community”, says Ruth Jarman of artist duo Semiconductor. The pair are self-confessed science geeks, and have taken up residencies at the NASA Space Science Laboratories in 2005; the Smithsonian Institute in 2010; the Galapagos Islands in 2010; and, since 2009, at San Francisco’s Exploratorium. They describe their approach as anthropological, detective-like, fly-on-the-wall; immersing themselves in the “alien environments” of science institutes and picking away at what they find. Their approach reveals hidden elements, things which institutes don’t see as important, or perhaps don’t have the means to communicate. These include artifacts such as the archive tucked away in the Smithsonian Museum of films of field trips going back to the 1920s showing beautifully dressed scientists standing on the edges of volcanoes, lighting cigarettes from the lava.

But Semiconductor also unveil the hidden lives of scientists, offering them space to talk about both the philosophical and mundane aspects of scientific research. Jarman described how one NASA scientist was pitifully grateful to have someone to talk to at length about his work (“My family doesn’t let me talk about space science anymore”). “What we’re doing to ourselves in the residency” Joe Gerhardt explains of their sense of sense-making in an alien environment, “we’re doing to them”.

It’s an approach that takes time and patience to develop intimate relationships of the people around them, and is not well served by shorter residencies. Their time in the Galapagos Islands, intended as a space to explore aspects of time and landscape, was frustratingly short, a fleeting two-week visit with limited access to the research sites. As a heavily protected conservation site, even scientists are severely limited in which parts of the archipelago they can visit; and as artists, Semiconductor were more restricted still. “They assume that artists are irresponsible” Gerhardt said, with Jarman interrupting “Or that the value of art isn’t seen, which is something you come across a lot when you go into science labs”. The pair collected what they could from the visit, including travelling up the side of volcanoes on horseback to shoot film footage, and developed two pieces: *Indefatigable*, a short film exploring how humans construct methods to learn about the physical world; and *Worlds in the Making*, a three channel moving image work that questioning how science affects experiences of the natural world.

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Semiconductor’s experiences bring up two critical points about arts residencies in science institutions. Firstly, forms of artistic practice in science institutes vary tremendously, reflecting the complexity of what ‘science’ itself is, and requiring access to many different types of resources and different time-stretches.

Secondly, residencies can embody conflicts around what forms of access artists are permitted to have, and what they are permitted to produce. Science is political, and science institutes are mired in wider landscapes of power and control which affects funding, research themes, education structures, and the very construction of science itself. Science also exerts considerably more political legitimacy than the arts, especially in austere times when it can be offered up as a patriotic tool for stimulating economic growth. In contrast, the arts operate under far scarcer resources, often framed as flighty, pointless, a luxury to be done without under difficult times.

Although the programs set up by SETI and CERN are comparatively new, artists have been spending time in science-based organisations for some time, in both the private and public sector. The Kohler plumbing company has run an Arts/Industry residency program since 1974; and Xerox’s Paolo Alto Research Centre has also hosted an Artist-in-Residence Program since 1993. Bell Laboratories has been deeply involved in the arts and technology scene, with artists including A Michael Noll and Lilian Schwartz, developing critical work around computer-generated art and animation in the 1950s and 1960s. This heritage of poking around the edges around emerging technologies can be seen in contemporary programs, such as Jer Thorp’s time as data artist in residence at the New York Times R&D Lab from 2011 to 2013, where he worked with the Lab’s team to develop the Cascade project which used data from Twitter to visualize the life-cycle of a news story.

What may be shifting however, are the power dynamics that thread through these relationships, and the freedoms afforded to artists who engage in them. The arts have been dependent on wealthy patronage for some time, offering both support and censor over what artists produce. Modern science and technology institutions have, however, the potential to place further controls over the very materials, tools, and infrastructures which artists use to create and disseminate their work. In 2014, Google commissioned and sponsored a piece of digital installation at the Barbican arts centre in London, offering a production budget of £25,000 to the winning idea. What might have been a standard arts commission under other circumstances drew criticism when it emerged that the art project had to use at least one Google technology out of APIs, platforms, languages, and toolkits. Applicants were also required to engage with the competition through Google Hangout video chat, necessitating engagement with the company’s own infrastructure.

As I was pulling together material for this piece, Laurie Anderson’s name came up again and again as a cautionary tale around the politics of arts and science. Following a forty-year arts program, NASA invited Anderson to be their first artist-in-residence in 2003. She spent two years with the agency, using her time to develop *The End of the Moon*, a restrained, comparatively low-tech performance art piece which reflected on the notion of disaster from the skies and the nature of war. The work was received well and Anderson has spoken favourably about her experiences in making it. Politicians, however, were less impressed—stating that the $20,000 fee which Anderson had received exemplified the “waste, fraud, and abuse in government spending”, congressman Chris Chocola passed an amendment which prevented NASA from using any future government funding to employ an artist-in-residence.

“You have to be clear to yourself, as well as the artists, about what your expectations are” says Ariane Koek, emphasizing that she has always made it “very very very very clear” to CERN management that Collide@CERN residents are free to create whatever they want in the program. This freedom is in part mediated by the fact that artists receive external support independent of CERNs own funding from European member states.

“I’ve never been stopped from doing anything”, Anna Dumitriu says, “I like to engage with the ethics of it upfront”. She keenly emphasizes that a central politics to her work involves the public’s right to understand microbiology, and the responsibility that comes with this interplay of knowledge and power. One of her recent projects has explored issues around human fecal transplants, and she acknowledges how this also involved considering how DIY communities will interpret the work.

The purpose of residencies also shapes the experiences of artists within them. Like CERN, the SETI program has—as yet—no internal funding, so residents have no financial ties to the institute. They are, however, expected to act as ambassadors, with their work and behavior reflecting well on both the institute and its community; if they don’t, SETI can terminate their position. Lindsay hopes that future residents will take explicitly political stances in their work, with the institute’s focus on non-human intelligence lending itself to explorations around environmentalism and forms of governance. But the residency isn’t a place for what he calls “snotty outbursts.” “For the politics to be effective,” he says, “ideas need to be delivered with respect for the other side.”

Whilst the politics of science squeeze around the edges of residencies, the programs themselves can offer a reprise from the politics of the art world itself. For Bill Fontana, CERN provided a space away from “the enormous egos I encountered in the art world, and where perhaps my own ego as an artist is irrelevant”. Away from the galleries, patrons, tastemakers, museums, commercial concerns, and financial markets (at least as they apply to art), Fontana says he felt like he was in a bubble: “I was free”.