

Science & Art?

Art the Science facilitates cross-disciplinary relationships between artists and scientists to foster Canadian science-art culture. **We believe in advancing scientific knowledge communication to benefit the public.** Our Science Artist Residency opens the doors of scientific practice to artists and provides researchers an innovative opportunity to communicate science. The outcome of this residency also provides the general public an accessible way to learn about ongoing scientific research in Canada. This residency consists of two phases, where **Phase I** informs the artist's work through an immersive laboratory experience and **Phase II** engages the public through physical and online exhibitions.

About Phase I

From March 19-29, 2018, Dr. Kevin Mumford's environmental engineering research laboratory at Queen's University hosted artist Owen Fernley for **Phase I** of their first science-artist residency. Mumford's laboratory is interested in the trajectory of hazardous chemicals when they are discharged into the environment, as well as the remediation of contaminated sites. The group's research projects range from experiments that mimic how liquids and gases move through porous mediums to computer models of those processes. Fernley was immersed into the research process from observing experiments to working alongside graduate students. He then showcased his artistic practice to the research team and created preliminary research-based artworks to demonstrate his artistic direction with this project.





Interviews

Pre-and post- residency interviews with the artist and scientist were conducted to gain insight on their perspectives before and after the experience. The pre-residency interview collected information on their interests, motivation for participating and prior collaborative experiences. The post-residency interview revealed the artist and scientist's overall impression of the experience, challenges and areas of improvement. Feedback from graduate students were also collected through interviews after the residency.



Personal Meaning Maps

A personal meaning map was performed at the end of both the pre- and post- residency interviews. This type of brainstorming activity allowed the artist and scientist to write down any thoughts they had in response to the topic: the value of an artist in the science community. It encouraged a free-flow thinking process which allowed the participant to visually organize their ideas before elaborating their thoughts to the interviewer.



Artist Diary

The artist recorded daily video entries during the residency to document the experience. Each entry was guided by questions surrounding the day's goals, what was learned, what was surprising and what the challenges were.



Personal Interview Insights



Scientist Perspective

Residency will provide a chance to communicate to non-experts and increase accessibility to research

Interdisciplinary collaborations limited to the engineering field

Overlapping Themes

Personal interests (science, algorithms, real world applications, computer modelling)

Public engagement in art and science disciplines promote discussions on important societal issues, but there are few opportunities to do so

Artist Perspective

Apply what is learned from this residency towards future applications

Past experiences in interdisciplinary collaborations included scientists and artists



Personal Meaning Map Insights



Artist can help provide **public attention on science**

Creating **emotional and meaningful connections** for the public through art

Increased accessibility to scientific research through different channels

New perspective provides scientists with a different way of looking at their research

Inspiration prompts new ideas, promotes creativity and problem solving

A channel to **translate knowledge** from experts to non-experts

Generates **relevance for artist and scientist** in society

Enforced communication and/or translation between two different disciplines

Increase the chance of **experimental discovery** or new hypotheses



Video Diary Insights



Goals

Gather information and understand research

Create and deliver a presentation about creative coding for the research team

Create preliminary art pieces which reflect what was learned

Learning

Experiments require immense control

Many different ongoing research projects in the laboratory (experiments - modeling projects)

Trial and error with coding attempts

Surprises

Graduate students are open to playing with experimental set-up

Researchers may not use all available tools in their laboratory

First development of sands as pixels went surprisingly well

Challenges

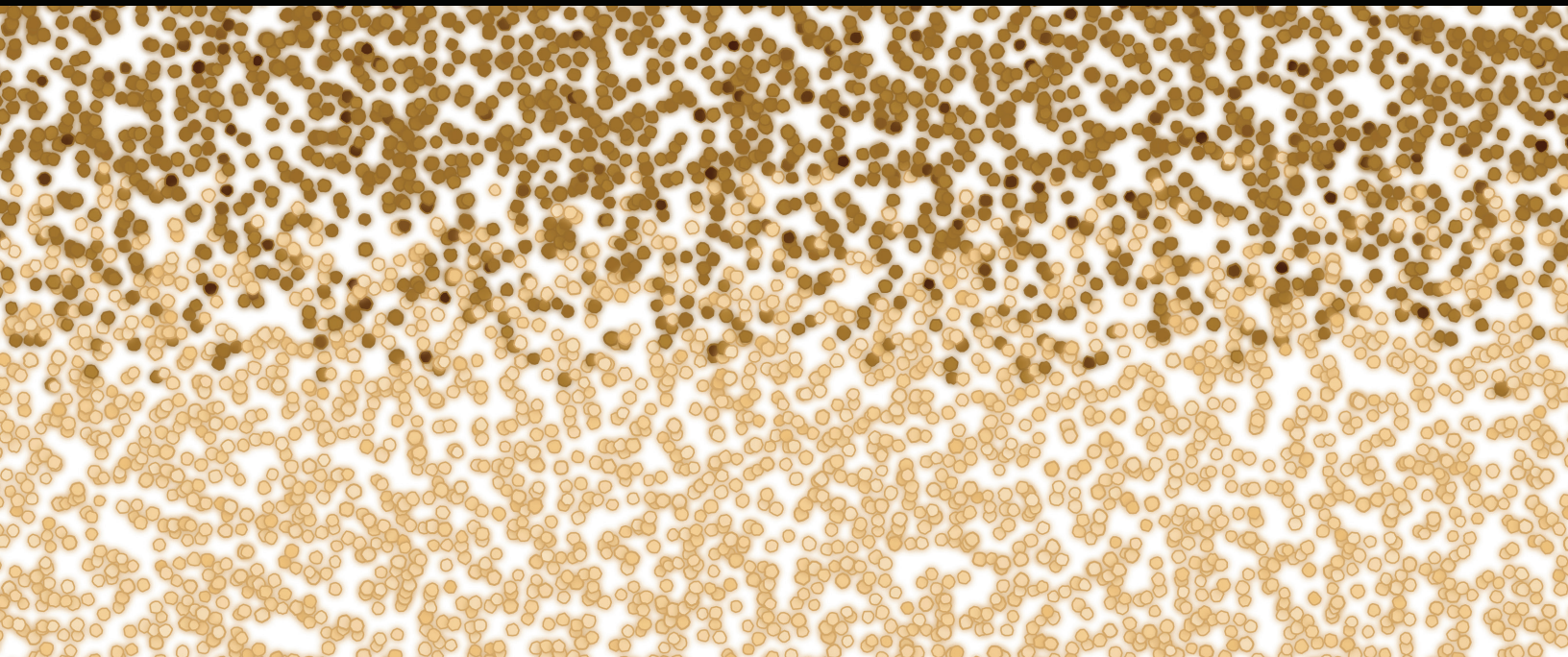
Engaging with graduate students and taking advantage of opportunities to ask questions

Finding an area of focus for the artwork

Getting a comprehensive understanding of the research



"Between the Sand" Work in Progress





Personal Interview Insights



Scientist Perspective

Research knowledge is more transferable to people outside the laboratory than initially thought

Logistics and planning were the most challenging parts

Surprised by the artist's commitment to capture essential aspects of the research in his preliminary artworks

Student Perspective

Concluding presentation to summarize the artist's progress would have been informative

A primer about the residency would have been helpful for discussions with people outside the laboratory

Overlapping Themes

Experience provided many learning opportunities

The artist encouraged the scientist and his graduate students to look at their research through a different lens

Experience provided a chance for both the artist and the scientist to improve their communication skills

Artist Perspective

Experiments were not always running because students also spent a fair amount of time writing and planning

The most challenging aspect was establishing an angle for the artwork

Appropriate facilitation should be prepared if there are issues in communication and/or understanding between the artist and the scientist





Personal Meaning Map Insights

Scientist Perspective

Saw **increased creativity** in students and a renewed sense of enthusiasm around their research

Provided a way to **increase awareness** of such an interdisciplinary experience to groups outside the laboratory

Overlapping Themes

Artist provided a **new perspective** by trying different things which would not normally be considered in the laboratory (e.g. looking at sand grains through a microscope, playing with experimental set-up)

Prompted **more engagement** in the laboratory through meaningful knowledge exchanges between the artist and the scientist

Artist Perspective

Observing puts the spotlight on the scientist and it usually makes them do a better job since they know someone is watching

Asking questions and having discussions are ways to validate the work that a scientist is doing



Residency Words of Wisdom

Scientists

Do it. Plan ahead and prepare an immersive environment for the artist.

Artists

Ask questions, take learning opportunities and engage with everyone.

Graduate Students

Have an open mind and avoid getting stuck in your discipline.



Conclusion

The residency experience received high praise from Fernley and the Mumford Laboratory. Fernley gained a better understanding of what research entails and can now apply his new experience to future projects. On the other hand, Mumford and his graduate students were left with a new lens to view their research and can continue to practice communicating their science to broader audiences. Thoughts on the value of the artist in the science community were consistent pre- and post- residency, particularly surrounding the themes of new perspective, knowledge translation and increased engagement. As noted in the pre-residency interview, public engagement is important, but there are few opportunities for either scientist or artist to take advantage of. That is why science-artist residencies like this one are so important. They can serve as both an incubator for interdisciplinary collaborations and an avenue for accessible science.

Recommendations

Principal investigators should plan to involve the artist in as much of the research process as possible for a truly immersive experience.

Future residencies should involve in-depth support and facilitation to foster engagement between the artist and the scientist

A concluding artist presentation should be made for the research group to showcase the artistic progress during the residency.

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