

Exploring the Intersection of Science and Art
Roundtable Discussion, 17 December 2021
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Participants

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Summary

1. Preliminary considerations

The aim of the meeting was to set the program in motion and to set the course amid the challenges due to the pandemic.

The three tangible goals of the roundtable were identified as: (a) to provide an opportunity for members of the Scientific Advisory Committee (SAC) to meet; (b) to begin planning specific activities for 2022; and (c) to establish a *modus operandi* going forward. The overarching aim is to carefully select projects to make the most of this unique opportunity – the first grant in NSF’s history to extend the reach of science to the arts.

The program’s official starting date was 15th August 2021 and it was approved for two years, with a possibility of extension to the third year (keeping the current funding level). The allocated funds are \$300K from the NSF, with additional support from the INI and the ICMS, £40K and £20K, respectively, to cover local expenses such as use of the facilities, staff time, cost of mounting exhibitions, and support for participants.

The project is ideally positioned for partnerships with leading interdisciplinary science and math institutes: the Isaac Newton Institute (INI, Cambridge); Institut Henri Poincaré (IHP, Paris); International Centre for Mathematical Sciences (ICMS, Edinburgh); and the Santa Fe Institute (SFI, Santa Fe, New Mexico). The four institutions have long traditions of fruitful engagement with the arts, including hosting exhibitions and art-science events.

In particular, INI has a sizeable collection of paintings, graphical works, and sculpture, hosts permanent and temporary displays, and employs a Curator of Art; ICMS exhibitions currently focus on the shape analysis and geometrical aspects of sculpture and other artworks; IHP will open in 2023 a new building designed specially to accommodate art exhibitions; and SFI hosts a permanent display of math-inspired art and models as well as many temporary art exhibitions. All four institutions regularly host artists in residence.

2. Priorities and themes

Among the many suggested interdisciplinary themes that could be explored, three stood out as perhaps the most intriguing and viable, at least in the context of planning for the first year of the program. These broad themes had already been discussed earlier (at the March 2019 Roundtable), but were now further refined. They may provide frameworks for single events (a workshop, for example), or for a number of thematically related activities such as a panel discussion and an accompanying exhibition traveling to a number of locations.

Theme I: Space, Time, and Scale in Art

Space – imaginary and impossible spaces; from 3D to 2D, perspective; reflections, symmetries, projections (maps); non-Euclidean geometries, transformations and deformations of space (isometric, conformal), geodesics. Motion and time – optical illusion and perceived movement; time and aging in art, explicit versus symbolic representations of time; kinetic art, mobiles, evolving displays; living artworks. Size and scale – scaling properties, patterns, quasi-fractal structures, small objects up close versus large objects at a distance.

Theme II: Fluid Dynamics in the Visual Arts

Liquid and gas flows *depicted* in mosaics, pottery decorations, paintings, and sculpture – laminar streams, smoke rising from pipes and chimneys, drops and bubbles (tears, soap bubbles), water instabilities, shallow and deep water waves, vortical and turbulent flows. Liquids *deployed* in the artistic processes – pourings, drippings, liquid rivulets, splashes, diffusive processes, viscous paint instabilities, wetting and seeping (watercolors).

Theme III: Intention, Meaning, and Perception

Intentional, serendipitous, or automatic art – figurative versus abstract, nature-inspired and nature-shaped, interactive and motion triggered installations, machine learning and AI assisted creativity. Coding and decoding in art – anamorphic images and puzzles, deliberately misleading perspective and *trompe l'oeil*, illusions, optical effects, hidden and sublimated patterns.

3. Modus Operandi

It was noted that the continuing pandemic presents challenges but also opportunities to organize events, such as workshops, panel discussions, or exhibitions, in hybrid mode, enlarging the number of potential participants and spectators. Some of the exhibitions could be fully virtual, while others mounted in “real spaces” of the participating institutes but with the accompanying online versions, which could extend for longer periods of time.

As a key priority, the program will need to develop, as quickly as feasible, an active web presence, which will be open and accessible to all. The website will function in a number of ways: (1) the pages will serve as the source for up-to-date information about current activities and plans; (2) the site will serve as an archive of past events (including video tours of past exhibitions); (3) there will be an online forum (e.g. a Slack channel) allowing organizers of various events, Advisory Committee members, and other participants and organizers to communicate efficiently; (4) a public discussion forum could also be created accessible to all; and (5) the website would ideally function as a networking platform of broader reach, a nexus for other science-art initiatives and a repository of links to related content outside the program itself.

The program's interdisciplinary nature is ideal for capturing public imagination and a robust outreach should be carefully developed. Apart from the website, which should be inviting and attractive and also designed to be entertaining, the program should include activities – or suggestion of activities – designed for school students, such as playful activities combining art and sciences, recommended lesson plans, visit to schools, invitations to exhibitions, etc. Collaboration with existing initiatives and organizations experienced in such outreach work would be optimal and assure a broader impact.

4. Specific outlines

Within the three broad themes outlined above, or perhaps for a separate project that SAC members may identify as a priority, it will be necessary to generate more specific plans and to prepare brief (two-page) outlines with the description of events to be organized, such as suitable activities. These “mini-proposals” should be guided by the following questions: (1) what are the goals, scope, and the format(s) of activities (workshop, panel discussion, seminars, exhibition, other); (2) will the project attract interest in the science and art-historical communities, and who might be invited; (3) what is the suggested timeframe and location(s); (4) what are the possible new avenues, or fruitful questions, that should be added or might emerge; (5) who could assist in further defining the proposed activity and help organize it?

5. Immediate steps

The most urgent, near-time tasks ahead are:

- (a) Create a dedicated website. This will require hiring part-time staff, for this and other organizational tasks, and finding a suitable platform to host the pages.
- (b) Create brief outlines for the suggested three themes (or other project) and suggest teams of organizers who could spearhead the effort.
- (c) Decide which exhibition could be organized in 2022, either to accompany an INI programme (e.g. TUR), or conceived independently.