

A Community “Artist in Residence” Program at LASP

A Proposal submitted to the Timmerhaus Fund Ambassadors program
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Overview

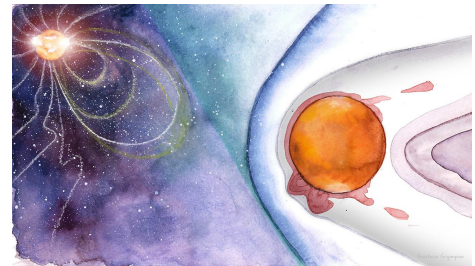
We propose to create an “Artists in Residence” program at CU Boulder’s Laboratory for Atmospheric and Space Physics (LASP). Through this program, professional artists and K-12 students from area schools will interact with CU scientists and engineers over the course of a semester about LASP research activities in space science. Both the artists and students will use their interactions to inspire the creation of new artwork that will be shared via exhibition with the larger Boulder community at the Boulder Public Library.

Motivation

The University of Colorado Boulder is well known nationally and internationally as a leader in space science. Our high levels of NASA funding are trumpeted on the sides of local buses. Students interested in space want to come to school here. And the state of Colorado has multiple “big name” companies in the space industry such as Lockheed Martin, Ball Aerospace, and United Launch Alliance. LASP is an important component of the reputation held by the university and the state of Colorado for excellence in space exploration and space science. LASP employs hundreds of scientists and engineers, is the world’s only academic research institute to have sent spacecraft instruments to every planet in the solar system, and has produced the largest award in the history of CU - the Mars Atmosphere and Volatile Evolution (MAVEN) mission to Mars. Despite all of the above, outside of space professionals, **relatively few people in the Front Range or Colorado have heard of LASP or know what it does.**



LASP is an organization of professionals from many STEM disciplines, including four different areas of space science (solar physics, space physics, planetary science, and atmospheric science), many areas of engineering, software developers, and spacecraft controllers, among others. **Despite this focus on STEM areas, there is a great deal of**



interest in the Arts from the scientists and engineers at LASP. In addition to the artistic aspects of their work (e.g. images from spacecraft missions, animations from computer simulations, etc.), many LASP employees are actively engaged in pursuing artistic endeavors as a hobby - from photography to painting to dance. Examples of their art populate this section of the proposal.

In addition to a general desire by LASP employees to be multi-dimensional, well-rounded individuals, **there may also be a connection between the creativity required to solve hard questions and the creativity involved in producing art** (e.g. *Lehmann and Gaskins*, 2019). Similarly, the integration of the Arts into a STEM education (i.e. “STEAM”) appears to result in science learning gains for K-12 students (e.g. *Brouillette and Graham*, 2019). Recognizing this connection, the show *Sesame Street* incorporated STEAM into its productions beginning in 2012. An example of the value of Art in STEM fields is that origami techniques were used to fold the solar panels on NASA’s James Webb Space Telescope in order to fit in the launch vehicle and keep the telescope safe during launch. “STEM” and “Art” can strengthen each other.



The three paragraphs above drove our team to want to make connections between LASP (nominally a STEM organization), local artists, and local K-12 art classes - enriching all groups in the process and advertising the value of both CU and LASP to people from the community who might not have reason to think about either very often.

Structure of Program

Our proposed Artists in Residence program has four main components, described below.

Advertisement of program and selection of artists - We will release a call for artists in April, 2023, with applications due in June. We will target artists in the Front Range, advertising through the [Boulder County Arts Alliance](#). Any kind of creative artist will be eligible for the program – including painters, sculptors, photographers, video artists, dancers, playwrights, and authors. Incentive to apply will include a \$6500 stipend as well as a guaranteed exhibition at the completion of the residency. Selection of three professional artists will be made by a small committee consisting of Dave Brain (APS Professor & LASP), Willow Reed (Professional Research Assistant at LASP in the Office of Communications and Outreach), Sky Shaver (LASP graduate student, member of Blue Moon Dance Company, and faculty at Tara Performing Arts High School in Boulder), and Lisa Schwartz (Boulder County Arts Alliance Board member, and program manager for CU Boulder Office of Outreach and Engagement).

Artist residency - The three selected artists will begin their residency in the Fall 2023 semester, starting with a 1-day orientation at LASP in early September. The orientation will consist of an overview of LASP science and engineering activities, presentations from members of the LASP community about their work, and a tour of LASP facilities. The artists would subsequently be included in the LASP community for the remainder of the semester. They would be given a place to sit at LASP, receive all LASP employee communications, and be encouraged to attend LASP seminars, attend weekly LASP coffee hours, and hold 1-on-1 interviews with LASP scientists and engineers (including students). Each artist will have a primary point-of-contact in LASP to help arrange interactions within the lab. LASP employees will also be encouraged to reach out to the artists if interested. A LASP seminar early in the semester will be dedicated to allowing the artists to share their previous work and current interests with the laboratory. In September and October we will also offer opportunities for the artists to shadow different LASP employees one day each week. By late October we expect that the artists will transition to producing their own artwork inspired by their interactions at LASP, with estimated completion by January 2024. The artwork can be completed at LASP or in the artists' own spaces, and the artists will continue to have access to LASP through the remainder of the semester. We will be in contact with the artists throughout this time, providing support and receiving progress reports before the completion of the program.

K-12 school visits - A critical component of our proposed program is the inclusion of K-12 students from the Front Range. We plan to provide funding for art classes from six partner schools (2 elementary, 2 middle, 2 high) to participate in a "STEAM for a Day" program at LASP in December 2023. Schools are in the process of being chosen now, as described in the next section of this proposal. Once chosen, teachers from the six schools will be invited to participate in the 1-day orientation for the Artists in Residence in September 2023. The STEAM for a Day program will consist of a shortened version of the LASP orientation conducted for the professional artists, including presentations from LASP scientists and engineers, presentations from LASP students, and a tour of LASP. It will also include presentations from and interactions with the Artists in Residence about their LASP-inspired art. The students, under the supervision of their teachers, will then return to their schools to create new art based on their visit to LASP. We will provide a stipend to each teacher for transportation to LASP and art supplies. Each group will visit LASP for ½ day (~4 hours). If our budget allows us to accommodate more than 6 schools then we will consider doing so.



Exhibition - Our program will culminate with the exhibition of artwork produced by both the Artists in Residence and the K-12 art classes. In a competitive process, we have applied for and received exhibition space at the Main Branch of the Boulder Public Library in February 2024, at no cost to this program. Our accepted proposal was entitled “Empty Space: The LASP Artist in Residence Program”. In collaboration with the Artists in Residence we will work to set up the exhibition. If space permits, we will solicit artwork from LASP employees to be included in the exhibit. We will hold a reception at the opening of the exhibit for the Artists in Residence, the K-12 students, and LASP employees. Each Artist in Residence will present their work, along with selected K-12 students (Artists and teachers will collaborate in selecting them). The exhibit will run through March 2024. After the exhibit ends the Artists in Residence will select one piece of art that will be placed on permanent display at LASP. The artists will keep the remainder of their work. We will also interact with selected K-12 students as appropriate to display their art more permanently at LASP.

Selection of Partner Schools

The National Science Foundation’s [*Elementary and Secondary STEM Education Report*](#) found a discrepancy in STEM test scores that is based on race, ethnicity, and socioeconomic status. Also, predominantly minority schools or schools with high levels of economic disadvantage tend to employ less-experienced STEM teachers. Our team contacted Dr. Melissa Braaten, an Associate Professor at CU Boulder’s School of Education whose research focuses on preparing grade-school teachers for teaching STEM classes. We learned that engagement in STEM/STEAM activities during late elementary/middle school years is often important in creating continued interest in the field. Also, we were informed that some of the school districts *surrounding* Boulder have less access to STEAM programs than schools within Boulder proper.

Based on this information, our CU LASP “STEAM for a Day” program will include at least 6 school groups of diverse ages from the greater Boulder area, including Boulder Valley School District (BVSD), St. Vrain Valley School District (SVVSD) and Jefferson County School District (JCSD). We created a short list of possible schools to include, placing emphasis on schools with high minority and economic disadvantage percentages. All data are from the Colorado Department of Education (<http://www.cde.state.co.us/schoolview>). Our list is provided in Table 1 below.

Our choice of schools from this “short list” will depend upon our interactions with the schools and their art teachers. We will prioritize the list and begin contacting schools if we hear back positively about this proposal. It is our hope that contacting them *this* semester about possible interactions and a field trip in December (the next school year) will increase the chances of the schools wishing to participate. We will emphasize that for each school we would like to invite *one* art class (possibly merged from multiple classes, but manageable in size) to LASP.

School	Grades	School District	% Free and Reduced Lunch Eligibility	% Minority
Columbine Elementary School	PK-5	SVVSD	85	84
Indian Peaks Elementary	PK-5	SVVSD	83	87
Rocky Mountain Elementary	PK-5	SVVSD	88	83
Timberline	PK-8	SVVSD	81	84
Longs Peak Middle School	5-8	SVVSD	76	63
Skyline High School	9-12	SVVSD	61	65
New Meridian High School	10-12	SVVSD	60	52
Columbine Elementary School	PK-5	BVSD	65	63
University Hill Elementary School	PK-5	BVSD	55	67
Alicia Sanchez International School	PK-5	BVSD	77	69
Casey Middle School	6-8	BVSD	57	46
Angevine Middle School	6-8	BVSD	44	36
Justice High Charter School	6-12	BVSD	91	55
Arapahoe Ridge High School	10-12	BVSD	68	63
Eiber Elementary	PK-5	JCSD	89	69
Edgewater Elementary School	PK-6	JCSD	82	80
Lumberg Elementary	PK-6	JCSD	91	83
Arvada K-8	K-8	JCSD	86	63
Alameda International Junior/Senior High School	7-12	JCSD	85	81
Arvada High School	9-12	JCSD	75	61
Jefferson Junior/Senior High School	7-12	JCSD	90	85
Rocky Mountain Deaf School	PK-12	JCSD	53	40

Table 1: Candidate schools to invite to participate in the “LASP STEAM for a Day” program

Timeline

Mar '23	Contact K-12 schools
Apr '23	Call for artists
June '23	Applications due
Jul '23	Artist selection
Sept '23	Artist orientation
Sept - Oct '23	Artist interaction at LASP
Oct '23 - Jan '24	Artist produce artwork
Dec '24	K-12 school visits
Feb '24	Exhibition reception
Feb - Mar '24	Exhibition
Apr '24	Art displayed at LASP
Apr '24	Lessons Learned activity

Anticipated Benefits

- Through the program, LASP scientists, engineers, and students will make and strengthen connections with area schools, impacting student perceptions of CU. These connections may lead to future interactions with teachers at the schools, extending the impact beyond the students who visit LASP in person.
- By interacting directly with a subset of the local community, LASP (and CU) will increase its local reputation both as a research institution and as an entity that trains students and engages with its community. A public exhibition that lasts for weeks will increase the number of people impacted by the program.
- The Artist in Residence program will specifically increase connections between the local STEM and Arts communities. While the CU Boulder Art Museum has its own Residence program, our effort specifically seeks to strengthen these cross-disciplinary ties - especially on CU Boulder's Research Campus.
- The program provides the Boulder Art community with an opportunity to see the value in research and higher education at CU Boulder through a collaborative environment designed for discussion between the fields. Resources for the continuation of engaging in higher education, such as CU's ACCESS program will also be provided to the artists upon completion of the residency.

Budget and Justification

\$19,500	Stipends of \$6500 for three Artists in Residence
\$ 0	1 month FTE for Willow Reed to help administer the program (\$5475 salary, \$3474 benefits provided by LASP)
\$ 0	1 month FTE for Sky Shaver to help administer the program (\$5947 salary, \$654 benefits provided by LASP)
\$ 0	Exhibition space costs (provided by Boulder Public Library) (space awarded for Feb-March, 2024)
\$ 3,500	Reception at exhibition (\$1600 rental space, \$1600 catered snacks/drinks and 10% tip)
\$ 500	Meals and refreshments during the Artist orientation to LASP (includes coffee break and lunch for artists plus LASP personnel)
\$ 6,000	\$1000 stipend for each of six K-12 schools (for art supplies and transportation to LASP)
\$ 500	Art supplies for students to use at LASP
\$ 0	LASP informational material (posters, stickers, etc.) for K-12 students (provided by LASP)
\$ 0	Display costs for produced artwork at LASP (provided by LASP)
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\$30,000	Total

Potential Future Extensions

If our program is well-received and successful then we may be interested in seeing it continued or expanded in future years. In addition to simply repeating the program with new artists, we could consider increasing the number of K-12 schools brought to campus through the program. We could also consider shifting or broadening the program to other departments or units (e.g. CIRES, the APS department, etc.) in future iterations. We will therefore be sure to conduct a “lessons learned” activity at the conclusion of the program.

**All artwork depicted in this proposal has been created by LASP employees or their partners.*

References

- Graham, N. J., & Brouillette, L. (2016). Using Arts Integration to Make Science Learning Memorable in the Upper Elementary Grades: A Quasi-Experimental Study. *Journal for Learning through the Arts*, 12(1). <http://dx.doi.org/10.21977/D912133442>
- Lehmann, J., Gaskins, B. Learning scientific creativity from the arts. *Palgrave Commun* 5, 96 (2019). <https://doi.org/10.1057/s41599-019-0308-8>