



Assessment of the 2016 Origins IdeasLab:

A Fresh Approach to Generating
Scientific Research



“...at the end of the event, I asked ‘who would do that again?’ The forest of hands told me we had inspired people to do something new.”

– Charles Liarakos, Lead Organizer from the National Science Foundation (NSF)

PREFACE

This report presents feedback and assessment regarding the 2016 NSF/NASA “Origins” IdeasLab. It aims to provide useful information about outcomes and experiences for all those involved as well as for anyone else interested in new ways to think about collaborative science. Collaborative science, in this sense, extends to include the generation and review of research proposals and the seeding new scientific communities.

A primary question in collecting information was how best to explore and present the many factors that distinguished the IdeasLab from “business as usual.” Initial, exploratory data collection quickly revealed a deep theme of varied subjective experiences as central to understanding the event and its outcomes.

What follows therefore emphasizes qualitative data. It builds a collage of individual narratives and images that combine to offer many different points of entry and exit. Individual readers are encouraged to navigate their own path through these stories, answering questions that motivated them to open the report and, ideally, some that we may not have asked.

Above all, this report seeks to approach assessment with the same creative, fresh and exploratory spirit as the original IdeasLab event.

Stephen Freeland,







rompt: "The 2016 'Origins' Ideas Lab"

Subjective, evolving judgements
are welcome!

This is a workshop designed
to explore and record
different perspectives

Generate (don't suppress) information

Try to avoid working towards
compromise and agreement...
redirect that energy into getting
the differences of opinion ALL
represented in the picture you are
building



TABLE OF CONTENTS

- 8** Introduction
- 9** IdeasLab by the Numbers
- 11** Collecting Feedback
- 15** Perspectives from IdeasLab
- 25** Themes from IdeasLab
- 33** Reflecting on IdeasLab
- 37** Closing Comments



“Participants from a diverse range of disciplines work in a creative, free-thinking environment and immerse themselves in a collaborative process around an important, complex challenge.”

FORMING THE IDEASLAB

On September 18, 2016, twenty-nine scientists convened at the Hyatt Chesapeake Hotel in Maryland to participate in a week-long workshop aimed at identifying potentially transformative research to address the origin and early evolution of life.

This event was funded by a first-of-its-kind collaboration between the Astrobiology Program of NASA's Science Mission Directorate and the National Science Foundation's Directorates for Biological Sciences and Geosciences.

Three months prior, scientists of many disciplines were invited to apply for an event that would allow them to interact and engage in free-thinking on first principles, learn from one another, and create an integrated vision for future research projects.

Meanwhile, these funding agencies hired the services of Knowinnovation ("facilitating and accelerating academic, scientific, interdisciplinary innovation") to prepare an instance of their "IdeasLabs," a five-day interactive workshop to produce radically innovative research proposals. Participants from a diverse range of disciplines work in a creative environment and immerse themselves in a collaborative process around an important, complex challenge.

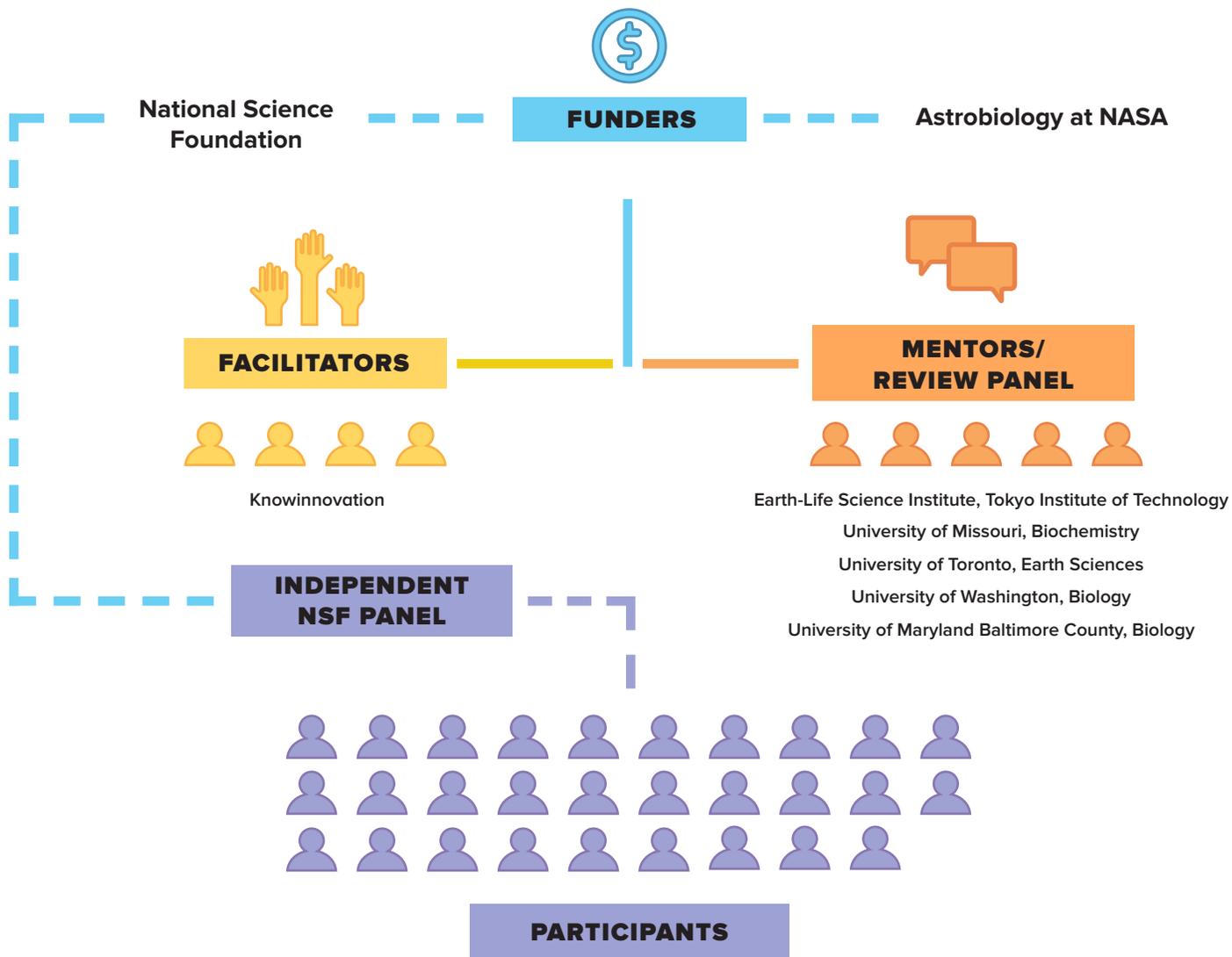
Working together, NASA, the NSF, and Knowinnovation selected 30 applicants to be participants and five scientists to serve as mentors/panelists who would guide the participants and review their research ideas.

As a result, the scientists were met by a team of four facilitators from Knowinnovation, two program officers from NASA, four from the NSF, and a mentor panel of five peers. Collectively, this organizational structure led the participants through a week-long series of activities. As the IdeasLab proceeded, interdisciplinary teams formed around ideas generated during the activities of the week and began to write formal research proposals.

Formal proposals underwent further revisions in the three months following the event, with formal reviews completed by the mentors/panel in January 2017. These proposals eventually translated into two major NSF-funded research awards and three NASA awards totaling \$8,910,667 of science funding for interdisciplinary teams to pursue new ideas relating to life's origins.

However, this important outcome, in itself, provides no insight into the complex web of elements that distinguish the IdeasLab from "business as usual" for both the funding agencies and the scientist participants. What follows seeks to address this bigger picture.

ORGANIZATIONAL STRUCTURE OF THE 2016 IDEASLAB



- Boston University, Bioinformatics
- Brandeis University, Chemistry
- California Polytechnic State University, Chemistry and Biochemistry
- Central Connecticut State University, Chemistry and Biochemistry
- Earth-Life Science Institute, Tokyo Institute of Technology: Physical Organic Chemistry, Geochemistry Microbial, Biogeochemistry, Complex Systems
- Georgia Institute of Technology, Chemistry and Biochemistry
- Jet Propulsion Laboratory, California Institute of Technology, Planetary Sciences Division
- NASA Ames Research Center, Exobiology
- Oberlin College and Conservatory, Biology
- Pennsylvania State University, Geosciences: Chemistry
- Portland State University, Chemistry

- Rensselaer Polytechnic Institute
- Saint Louis University, Chemistry
- Santa Fe Institute
- University of Arizona, Molecular and Cellular Biology
- University of Colorado Boulder, Geological Sciences
- University of Kentucky, Chemistry
- University of Minnesota, Biological Sciences, Genetics, Cell Biology and Development
- University of Southern California, Earth Sciences
- University of Texas at Austin, Molecular Biosciences
- University of Utah, Biochemistry
- University of Wisconsin-Madison, Botany
- Yale University, Molecular, Cellular and Developmental Biology: Geology, Geophysics

\$8,910,667

Total amount of research funding awarded as a direct result of the IdeasLab



Directorate
For Biological
Sciences Emerging
Frontiers (EF) /
XC-Crosscutting
Activities Program

\$2,241,606

Biochemical, Genetic, Metabolic and Isotopic Constraints on an Ancient Thiobiosphere

State Date: July 15, 2017

\$384,373	AWARD 1724150: PI – Daniel Segrè (Boston University)
\$470,080	AWARD 1724300: PI – Shawn McGlynn; Co-PI - Christopher Butch (Earth-Life Science Institute)
\$484,560	AWARD 1724099: PI – Christopher House (Pennsylvania State University)
\$353,276	AWARD 1724909: PI – Betul Kacar (University of Arizona)
\$549,317	AWARD 1724393: PI – Boswell Wing (University of Colorado at Boulder)

\$1,971,443

Life Out of Water – Possibility of Evolution in Non-Aqueous Environments

State Date: July 15, 2017

\$775,804	AWARD 1724274: PI – Loren Williams (Georgia Tech)
\$464,591	AWARD 1724011: PI – Michael Travisano (University of Minnesota - Twin Cities)
\$133,664	AWARD 1723572: PI – Sarah Maurer (Central Connecticut State University)
\$597,384	AWARD 1724348: PI – Paul Bracher (Saint Louis University)

\$4,697,618

\$997,620

Becoming Biotic: Recapitulating Ancient Cofactor-Mediated Metabolic Pathways on the Early Earth

Barge, Laura (Jet Propulsion Laboratory); Goldman, Aaron (Oberlin College);
LaRowe, Doug (University of Southern California)

\$2,499,998

**The Emergence of Evolvable Surface-Associated Interacting Molecular Ensembles:
A Chemical Ecosystem Selection Approach**

Baum, David (University of Wisconsin); Lehman, Niles (Portland State University); Adamala, Kate and Travisano, Mike (University of Minnesota); Rogers, Karyn (Rensselaer Polytechnic Institute); Kempes, Chris (Santa Fe Institute); Epstein, Irv (Brandeis University); Segrè, Daniel (Boston University); Iwasa, Janet (University of Utah)

\$1,200,000

Understanding Translation through Experimental Evolution

Adamala, Kate and Travisano, Michael (University of Minnesota); Butch, Christopher (Earth-Life Science Institute); Ditzler, Mark (NASA); Kacar, Betul (University of Arizona); Kempes, Christopher (Santa Fe Institute); Segrè, Daniel (Boston University); Williams, Loren (Georgia Tech); Wing, Boswell (University of Colorado Boulder)



Astrobiology at
NASA

MANAGED TO THE MINUTE

TEAM BUILDING
- Speed dating
- Game night

Agenda and Terms
- Start pitches
- Start meeting time
- Start time to prep full proposals

Intellectual herding (in a good way)

Construction deprivation

WIBNI

Product

FOCUS
NO EMAIL (HARKINS)

Making new colleagues

RECRUITMENT

Really fun

Really fun: talking about science with people who love talking about science

HR/HR =
Program of SIM+ and interesting due to 'f

Mean Team / Mean Review

round: statement sets

COLLECTING FEEDBACK

This report presents feedback collected between January and August of 2018 (1.5 – 2 years after the original IdeasLab event and 6 – 12 months after research grants resulting from the IdeasLab were distributed).

All those present at the original event were contacted to participate in an in-person feedback workshop at UMBC. As a result, on June 13, 2018, 12 individuals from each IdeasLab group (participants, funders, mentors, and facilitators) convened at UMBC for 24 hours to explore perceptions and impact of the event.

During this in-person event, each individual completed a brief five-question survey of perceptions, then engaged in one of three groups (each comprising four individuals) with the qualitative research tool Co-Navigator to produce a visual, tabletop map of their experiences at the IdeasLab. Finally, the focus groups developed themes from the survey responses and the output of the Co-Navigator sessions.

Analysis of results from this in-person event then led to interviews (telephone, video-chat, and in-person) over the ensuing six weeks with additional participants, mentors, funders, facilitators, and organizers to explore themes that had developed.

KEY

-  - FUNDERS
-  - MENTORS/REVIEW PANEL
-  - FACILITATORS
-  - PARTICIPANTS

Co-Navigator Teams



<https://www.ind.ku.dk/english/interdisciplinary/materials/conavigator/>

Focus Groups

D. LEW



T. WOWK



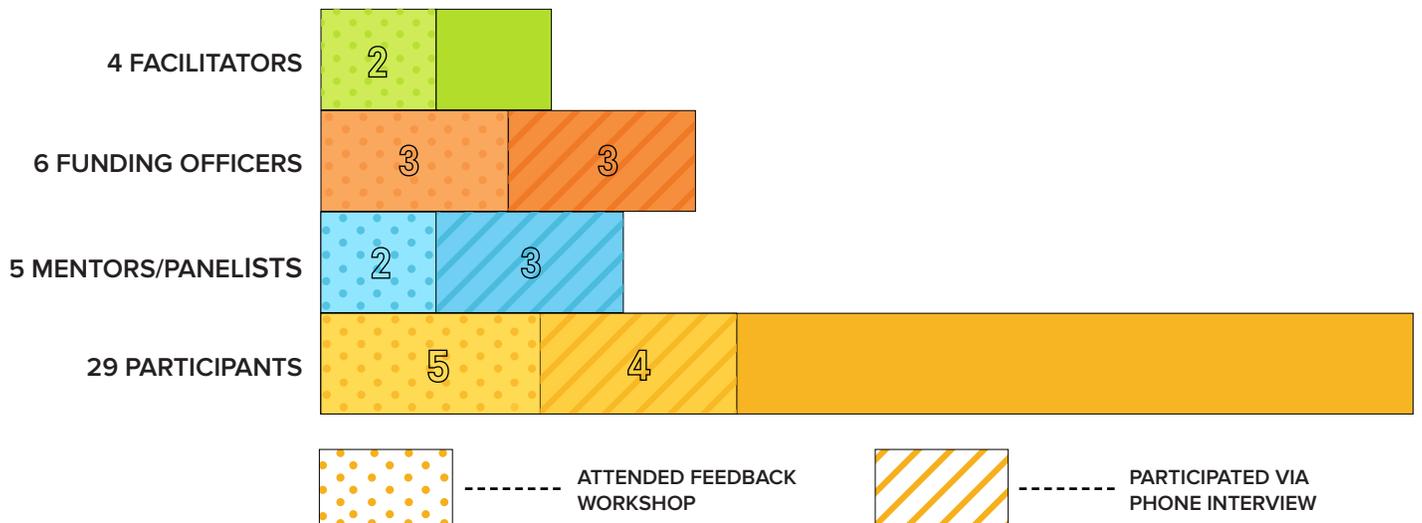
E. MELLUSO



S. CUPID



Representation at the Feedback Gathering



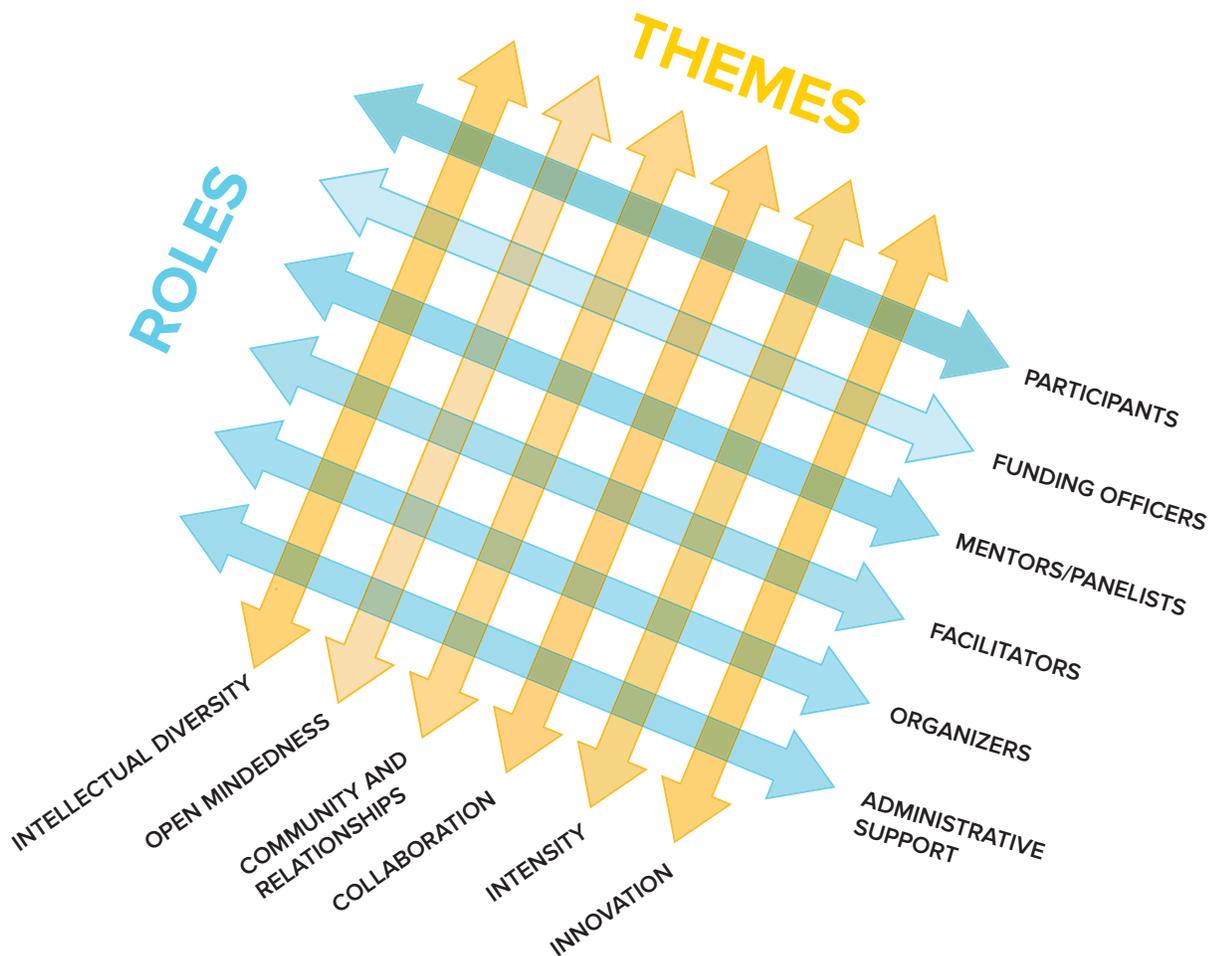
Roles vs. Themes

In the pages that follow, feedback is presented in two different contexts, “roles” versus “themes.”

“Roles” refer to the organizational structure of the original event (page 9), which involved the coordinated activity of funding officers, participant scientists, facilitators (Knowinnovation), a mentor/reviewer panel, and those responsible for organizing the original event (both “organizers” and “administrative support”). Feedback is thus organized and presented from all or some of the individuals who played a given role in order to explore a specific professional perspective.

“Themes” refer to overlapping concepts that emerged from qualitative analysis of multiple individuals’ feedback, regardless of their role at the original IdeasLab. Funding officers, participants, and mentors/reviewers converged, for example, on comments regarding the high level of creativity/novelty they witnessed and the importance of relationships (community) to the experience.

This organization produces a simple weave of information which invites many possible paths in order to explore a particular aspect of the IdeasLab event.



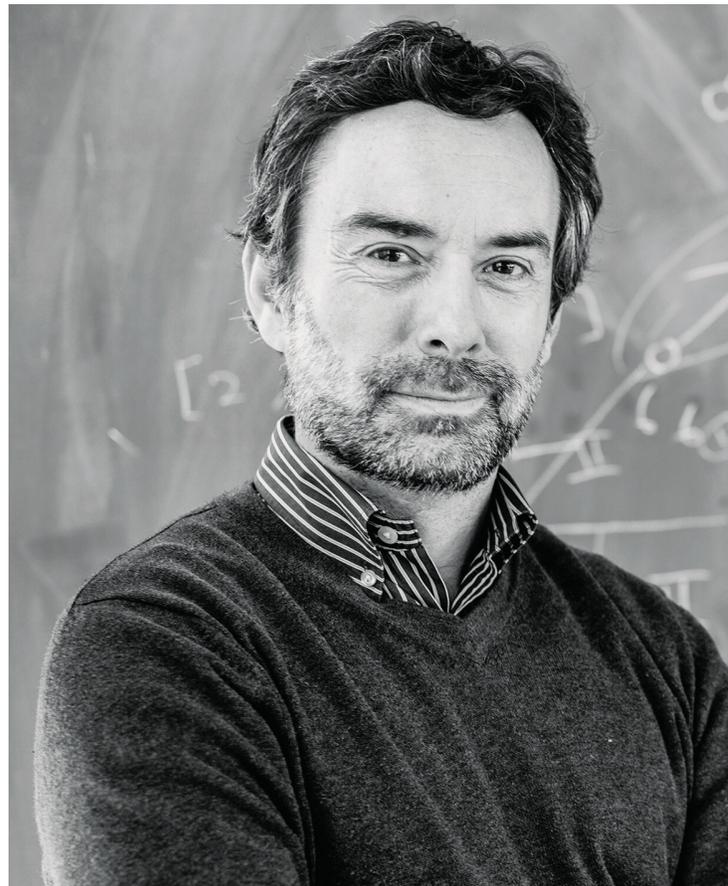
Charles Liarakos

PROGRAM DIRECTOR AND
SENIOR SCIENCE POLICY ADVISOR, NSF

I had many conversations with my colleagues at NASA Astrobiology about the state of research into life's origins. Our mutual perception was that the research needed a push to move beyond the dominant paradigms of "metabolism first" versus "RNA first" and to transcend an academic culture that tended to sustain the status quo. In particular, we identified the need to find a novel approach to both project development and merit review if we were to fund significantly new and different origin of life research projects.

I perceived IdeasLabs as a way for the NSF to generate something analogous to the Defense Advanced Research Projects Agency (DARPA), providing a way to direct a low percentage of our total funding into high risk projects capable of really moving a field forward. NSF had to be convinced that this new approach was in the best interest of the research community and the agency. To this end, the Biological Sciences Directorate led the way with several IdeasLabs that addressed different biological problems, increasing our confidence in the process and results of the IdeasLabs.

I believe that the Origin of Life IdeasLab succeeded in changing peoples' thinking. I see it as one of the very best things I achieved in my career with the NSF. No one group or individual dominated the event. All participants were fully engaged and freely exchanged ideas without regard to professional status or experience. The mentor group was a key catalyst in the success of these interactions. We had only five days together to accomplish a great deal, but we also had excellent facilitators.



“The challenges of developing the Origins of Life IdeasLab reflected the complexities of interagency collaboration.”



Mary Voytek

SENIOR SCIENTIST FOR ASTROBIOLOGY, NASA

Interdisciplinarity is baked into the scope of NASA astrobiology. I perceived the IdeasLabs as a mechanism for the entire field of origins to step back from its current, isolated specializations in order to bravely address a messier and more inclusive reality—a reality that did not begin with a clean reaction in a pyrex container.

To achieve that end, the IdeasLab asked scientists to leave their agendas at the door—an unsettling and emotional experience. It was fascinating to watch scientists surrender control to non-scientists in order to develop intellectually, and it was satisfying to watch the moments when these same scientists who struggled initially later became aware of the process working for them.

The challenges of developing the Origins of Life IdeasLab reflected the complexities of interagency collaboration. Also, because of the IdeasLab's unique process, it required careful administrative and legal work to set aside funding not only for projects delivered by an IdeasLab but also for scientists to convene in order to generate these projects.

I think I have learned that scientists earlier in their careers are more willing to change their thinking in ways that can drive innovation, which means I need to better support them. In particular, I remember one proposal that went through a traditional review process because it was not quite ready in time for the IdeasLab funding cycle. The reviewers were critical of exactly the aspects that the IdeasLab had nurtured: taking chances and presenting a bold new paradigm. That shows me I will have to look beyond reviewer panel scores to ensure I am not failing to support the sort of proposals that IdeasLab produced.

Andy Burnett

CEO OF KNOWINNOVATION

This IdeasLab was more complicated to organize than some because it was multi agency, which can imply different cultures and objectives (such as definitions of “high risk”) as well as different rules under which each must operate. Early conversations, stretching back well over a year before the event, sought to identify and explore some of these differences.

I perceive funding agencies use IdeasLabs in the hope of providing a mechanism for different scientific sub-communities to interact, thereby accelerating a specific area of scientific research. Capturing and perhaps complementing this goal is a statement from a participant in our very first IdeasLab for the NSF: “I rediscovered the joy of doing science.”

STEPHEN FREELAND

PI, NSF EF-1655137

I served as principal investigator for the NSF grant that financed scientist participants to attend the IdeasLab. I was proud to play this role, feeling a deep empathy with the goals of the event—both in terms of obtaining new ideas on a research topic about which I am passionate and in terms of exploring different mechanisms to generate and fund such ideas. It was deeply encouraging to see two federal agencies collaborate to these ends, and I am grateful to have been a part of that. My role brought me into the middle of something significantly larger than the scope of the grant, which I had to work hard to understand.

For example, costs associated with the organizers, facilitators, mentors and funding officers were not part of the NSF grant, which created some complications and confusion when it came to payment to vendors for the entire group. The choice of a hotel two hours from the nearest airports (which occurred beyond the purview of the NSF grant) added significant complications to supporting everyone's travel. As the event developed, I also became convinced that many of the organizers perceived themselves to have part of the event within their purview but were unsure who had the other parts.

These sorts of issues were minor compared to the positives of the IdeasLab, but they made me extremely grateful for the grant's explicit inclusion of administrative support. Samirah and Alexis were invaluable in dedicating their time, effort, and skill to ensure the grant's larger goals were not compromised by logistical problems.

Beyond these logistics, when I submitted the grant I was unaware that I would not be involved in selecting the participants. This is understandable with hindsight, but not knowing about this created confusion as I had written specific commitments to demographic inclusivity into the grant as part of the "Broader Impact" statement.



ALEXIS PATULLO

PROGRAM ASSISTANT, NSF

At the time of the 2016 IdeasLab, I was a program assistant for the NSF—the bottom of the agency's administrative process chain, responsible for aspects such as logistics of managing the logistics of panels and reviews. I was thrown into the event halfway through the planning process with little idea what I was getting myself into. I do not think there is any information out there at present to guide someone like me, and I would like to support my counterparts in future IdeasLabs.

However, I also think the agency is starting to realize that its administrative staff can do more than they have been traditionally assigned. With the benefit of hindsight, I see significant potential in IdeasLabs to increase the efficiency of NSF by providing professional development (and therefore job satisfaction) to its administrative staff. Being present with the scientists and mentors, I experienced the creative process and the humanity behind what I usually receive as written ideas. I think the experience of getting to know those involved, and taking a role in supporting them into ideas-based collaboration, could make me more useful in working with program officers to create well-rounded and balanced reviews.



SAMIRAH HASSAN

ADMINISTRATIVE ASSISTANT, INDS/UMBC

My role was to provide administrative support to the 30 scientists who were traveling to attend the 2016 IdeasLab. In particular, I was tasked to facilitate travel, lodging, and reimbursements for all participant scientists.

The most interesting and challenging part of my work was organizing a large group. Every individual had different needs. Some participants required international flights that exceeded the per capita budget. Others drove to the conference and requested reimbursement for mileage. One participant worked for NASA and was therefore ineligible for reimbursement from the grant. This all resulted in a lot of communication back and forth with the vendors, participants, and funders.

More generally, I would say that at first it was not clear that my perceived role matched what the NSF wanted. Alexis from NSF was extremely helpful. For example, she investigated and communicated dietary restrictions and helped me work with the hotel (since a block booking included mentors, funders, and Knowinnovation who were beyond the scope of the NSF grant). Overall, it was extremely confusing who had what responsibility. I would recommend that similar collaborative IdeasLabs include face-to-face meetings with all facilitators at the beginning and toward the end of the lab to mitigate some of this confusion.

“Administrative staff can do more than they have been traditionally assigned.”



Four funding officers from the NSF and two from NASA were present at the IdeasLab. Of these six, three attended the in-person feedback workshop and the other three were later contacted for telephone interviews.

“We were looking for new questions, not answers.”

Funding officers’ perceptions focused on the process by which research proposals are developed rather than merely funding outcomes. A central goal, all agreed, had been to “penetrate the suffocating blanket of academia—break things down in order to help them reassemble in new ways...pull people apart in order to help them find new perspectives.”

One explained, “Usually the way our agency interacts with research scientists is to tell them what we are interested in supporting; they then respond by telling us how their research can fit with that goal.” During the early stages of the event, a participant who had achieved noteworthy success with traditional funding mechanisms approached the funders, saying, “Just tell us what you want us to do and we will do it!” The funder had responded: “If we knew what we wanted, we would have told you: All we can ask is that you to engage with the experience.”

“A lot of work goes into creating the right kind of space for the right kind of spontaneity.”

All funders agreed that the process by which applicants were selected as participants seemed to have worked. They noted the absence of traditional hierarchy in the process of project development, such as dominance based on prestige or seniority, and the candid way that scientists worked together to arrive at the best ideas. “In academia right now, there is not a collaborative and constructive way to criticize someone else’s work,” one funder shared. “We were striving to achieve this.”

All funders perceived that as the week progressed, participant skepticism subsided as groups and projects

developed through those candid discussions. “It may appear that creativity lies with coming up with new ideas (generation),” one shared, “but a lot of the creativity lies in what choices are made in the filtering of ideas (evaluation).”

“As funders, we didn’t quite go through the same emotional roller coaster as participants.”

Funding officers described a perception of separation from others in the room. “It was a little isolating,” one shared, “because you guys were all doing this big shared emotional experience and we’re just kind of sitting there watching it happen.”

However, it was clear that this separation was at least in part intentional and strategic, as funders stressed it was “not our goal to shape at all” and that “it is important to find ways to manage and soften the heated emotions that can arise from the intensity of the event, particularly as the role of evaluation increases.” Even more specifically, “We tried hard to avoid contact with the participant groups because that can make it harder to notice if someone is becoming steamrolled...You’re trying to re-engineer things but relying on the mentors to tell you what’s going on, which is difficult.”

“I don’t think we appreciated fully how different the experience would ultimately be from normal academic discourse.”

In terms of outcomes, all funding officers were pleased overall. This was true for the research proposals that emerged, which were, according to the funder, “kick ass science” and “technically challenging, radically new... That’s something as a program officer that you look at as being something special.”

Twenty-nine participant scientists attended this event. Of these, five attended the in-person feedback workshop and an additional four were interviewed by telephone.

Open Minds Encouraged

Overall, participants expressed strongly positive perceptions of the IdeasLab. They were “grateful for the experience” and were “encouraged that the funders are thinking about how to get projects out there that would probably be squashed by typical peer review.” Most described first and foremost an emotional intensity to the event that formed an important context for their experiences: “Everybody had the same experience of feeling drained and finding ways to cope with it.”

That intensity came from the range of emotions encompassed by a single week: skepticism and awkwardness, through suspension of disbelief, increasingly comfortable communication, and onward to trust, excitement and enthusiasm. These emotions cycled during the week, with a general trend in the direction described. Set against this background, participants indicated clear points of consensus (if not always unanimity) about themes characterizing the week, its outcomes, and its legacy.

Most were clear that the entry point for the event was to discard preconceptions in order to be open to new ideas. “Don’t go in with a set plan or expectations ... Expect to be simultaneously happy, interested, stimulated, and frustrated,” one participant shared. Another reported, “It should be fairly clear I did bring in an idea, which ran the gauntlet of many challenges and evolved considerably, but for me it was about connecting with the right people.”

Fertile Ground

All agreed the event succeeded in creating a fertile environment for ideas to develop. Participants did not have “worries I’d be ridiculed or criticized” and were “open-minded to many possibilities.” Reflecting on how this came to be, some reported variations around, “The absence of many big names was great in terms of fostering new ideas.”

Others went further, noting that the mechanics of the event invited unique collaborations. “Interdisciplinarity was woven into the fabric of the event by bringing in people of diverse backgrounds,” a participant said. “This inverted the incentive structure of ‘interdisciplinarity’ from traditional funding, where it is tacked on as an afterthought.” Many noted an unusual and helpful collaboration with funders and reviewers (mentors): “This is a unique experience to generate ideas for proposals and then get feedback from the reviewers,” one said. Another added, “The best way to generate proposals that could be funded was to pay attention to what the mentors were saying in their feedback even if you didn’t agree with it.”

“It was about building ideas and then letting them go.”

Intellectual Generosity

Perceptions of the mechanics that produced good outcomes usually identified the repeating cycle of creativity (idea generation) and judgment (idea filtering): “It was about building ideas and then letting them go.” Letting go of ideas incorporated two aspects: “We might simply be told by funders or mentors that our ideas were not interesting enough,” but also “you had to be generous with your intellect. You might be involved in the early generation of an idea, but then others might take that idea and move it onwards to a higher stage of development. You had to accept that others might be better equipped to take over an idea you had introduced.”

Reflecting on what caused ideas or teams to fail, participants again highlighted the theme of intellectual generosity. “You might have built the car, but someone else might climb in the driver’s seat and drive away. You just have to exhale. It was fascinating.”

When asked what they had learned, many participants reported rethinking the process of generating ideas. “The most surprising thing about the whole experience was a change in my view of creativity,” one said. “I entered with the preconception that creativity cannot be structured...the IdeasLab taught me that a highly controlled process, step by step, could lead to the desired outcome of high risk/high reward fresh ideas.”

Building a Network

The positive legacy of the meeting cited most frequently was not funding but an improved network of colleagues. “I’ve made a number of new colleagues through sharing this intense experience,” one shared. For another, meeting NSF and NASA program officers for the first time was a highlight: “These are incredibly important relationships for any professor.”

Those who received funding expressed gratitude, though often qualified, most often regarding the time that lapsed between the meeting and receiving funding. “It is hard to prepare my research group for such new work without knowing how and when the funding will appear,” one lamented.

Maintaining Connections

Complementing this creation of relationships, the strongest theme of legacy was a question: what happens next? Participants wondered, “How are they going to continue community building?” and expressed disappointment that “we went through the first four steps of building a community, and then there was a lot of momentum there that just was allowed to dissipate.”

Participants were optimistic that there was “a lot to be developed post-event that could lead to some interesting stories,” but many felt “clueless right now about what is going to happen.” Looking ahead, one recommended that future IdeasLabs “think about how to engineer the process in order to make a smoother continuation for some of those new ideas generated to propagate out into the regular academic system.”

**“I cannot shake
the feeling
that creative
opportunities
have been missed
to leverage the
role mentors
played during
the week.”**

Four research scientists working under the direction of a fifth were brought into the IdeasLab as mentors, and (later) proposal reviewers. Team members brought specific expertise in geoscience, biochemistry, bioinformatics, evolutionary biology and physics/mathematics as well as experience managing and supporting teams of scientific researchers.

On the positive side...

All agreed that they had enjoyed interacting with the concepts and people of this IdeasLab. Specific mention was made of forming new and strengthened relationships with diverse individuals from across this interdisciplinary field, not least each other. Comments ranged from general (“There were deeply positive aspects to this experience, mainly in terms of getting to meet and interact with these wonderful minds and the ideas they generated” and “It has changed my filters for literature, people and conferences.”) to practical details (“I was intrigued by the techniques used by Knowinnovation to break down barriers and get participants on task.”)

On the negative side...

No mentor perceived that they had entered the experience with a clear understanding of the scope and duration of their duties. In particular, all expressed a lack of awareness that they were to become a formal review panel. Here again, individual perceptions spread across a spectrum.

One blamed their own lack of attention to administrative information for their misunderstanding of the commitment, and another expressed that the lack of awareness might have actually benefited the group’s relational dynamic early in the idea-generation process. However, others were convinced the organizers and/or funding officers “kept moving the goalposts for mentor responsibilities and were “reluctant to state up front the extent of mentor duties.”

In general, mentors were frustrated and even “disturbed” that their role was meant to shift from mentor to formal reviewer, feeling that fact was poorly communicated. Mostly simply, mentors unanimously complained that they did not understand the extent of the time commitment to participate in the IdeasLab.

While communicating the time commitment and role-shifting for mentors was clearly a challenge for this IdeasLab, we believe it is not insurmountable and, if carefully considered, should not hinder the organization and implementation of future IdeasLabs.

The range between mentors in the final balance between positive and negative is clear within the five individuals’ answers to the question: would you do this again?

“In principle, I would play the same role again so long as I perceived the topic was well-motivated and urgent and that I could bring particular skill or perspective to help.”

“As things stand, I would not consider being a mentor for another IdeasLab. Failures of communication form the underlying theme of frustrations I encountered.”

“It has really opened my mind to new ideas, to connecting beyond my comfort zone, but if I were to do this again, I would want clear expectations up front about shifting roles and duration.”

“Whereas participants walked away with fascinating projects that I had a part in nurturing, I left with legal and procedural walls that obstruct my further involvement in those projects... It is unfortunate that there was no format by which mentors could continue their involvement with ideas that they invested so much time and effort helping to bring into existence.”

“I do not know whether I would do this again... The biggest factor would be knowledge that playing the role of mentor creates separation between me and the community/ideas in which I am professionally interested. I cannot shake the feeling that creative opportunities have been missed to leverage the role mentors played during the week.”

“The event is not only about generating a different kind of idea, but also about different criteria for review.”



A team of four professionals from Knowinnovation led the IdeasLab week in person. Two of these professionals attended the in-person feedback workshop.

Innovative Process Drives Ingenuity

The approach to feedback taken by the team from Knowinnovation was driven by the question, “If we were to do this again, how would we take our experience forwards to improve our process?” On this note they were “glad to see the follow up” leading to this report; “it doesn’t happen too frequently.”

They were clear about their goal of delivering a process that accelerates the formation of relationships across boundaries that often divide academic activity. “Outside of an IdeasLab, it could take a year to build a group of people, get them talking past jargon and into conversation,” one facilitator noted. The Knowinnovation process, however, “puts them in enough stimulating environments and conversations to actually have that idea.”

Overall, the facilitators viewed this IdeasLab as a success, both in terms of “how satisfied the organizers were with the idea that came out” and in terms of the ideas generated, which “would be unlikely to be funded by a normal review process. They might well never even been submitted for review.” They were unified in thinking that an appropriate body of diverse, open-minded participant scientists had been convened for the week. However, they were clear to underscore that “the event is not only about generating a different kind of idea but also about different criteria for review.”

Miscommunication and the Mentors

This importance for review connects to the primary perceived area for improvement with which the mentors agreed (see previous page): “The short straw in this process goes to the mentors... how can we change what the expectations are of them, in order to make it more equitable, more fair?” Organizing this IdeasLab on behalf of two funding agencies led to “more confusion at this IdeasLab than at others,” they said, “because there were two sets of requirements which were not made explicit to anybody.”

In particular, Knowinnovation was not privy to the expectation from funding agencies that the mentors “switch mid-week from being mentors to being reviewers. Normally at an IdeasLab, if that switch even occurs, it happens after the final presentations.” From the perspective of IdeasLab mechanics, “I don’t think that it was necessary for mentors to not know about the extent of their roles and the mid-process switch to becoming reviewers; I think it would be fine to tell them their job is to provide real time feedback and peer review.”

The team leader perceived that for this particular IdeasLab, one of the organizers “had such trust from working with Knowinnovation in the past that they were convinced everything would sort itself. This event highlighted to me that there is such a thing as too much trust ... They could usefully have payed more attention to the requests and concerns of the facilitation team ahead of the event order to build a rapport, and to clarify all expectations and roles.

INTELLECTUAL DIVERSITY

The IdeasLab was designed to be intensely interdisciplinary, and that theme emerged in many attendees' reflections. Before the workshop even occurred, organizers carefully selected from the applicant pool "people who were collaborative and more comfortable with interdisciplinary research," one funder said.

"This event is helping by connecting and consolidating folk who otherwise might pursue independent research trajectories."

The selection committee weighted the applicants' commitment to interdisciplinary work much more heavily in the selection process than an applicant's professional stature. In fact one funding officer reported that the proportion of scientists with an orientation toward interdisciplinary work "just happens to increase as you get into earlier cohorts academically."

The vast majority of attendees found the diversity of backgrounds among the participants to be beneficial throughout the IdeasLab process. "Once every few years, I happen to be involved in occasions where I get to talk to physicists, biologists, and mathematicians, and I always benefit," one participant said. They commented that even today, academic disciplines tend to be siloed on their campuses. While this participant "tries to read broadly, there's not that much time to read that broadly." The IdeasLab, then, facilitated connections between researchers that would have been unlikely to arise organically, even for scientists who make an effort to stay abreast of current work in other disciplines.

One participant noted that the professional connections facilitated by the IdeasLab might have far reaching consequences for individual researchers' careers: "Perhaps this event is helping by connecting and consolidating folk who otherwise might pursue independent research trajectories."



Bringing in such a diverse cohort created an environment where fresh ideas could emerge. “Being around so many different people with so many different areas of expertise brought in a new dimension to my way of thinking about the problem,” one participant explained. Even for those with previous experience in interdisciplinary work, the IdeasLab broadened their frame of mind. “Cross-disciplinary training helped me understand the whole picture,” a funder shared, adding, “I came in with a diverse education background, which was further expanded by the IdeasLab experience.”

Each discipline has its own way of tackling the question of the origin of life, and each has its blind spots. One participant reflected that “listening to a bunch of people at the IdeasLab allowed me to figure out where in the community the disconnect was.” For this participant, that made all the difference: “I think figuring out where the holes and miscommunications were made the ultimate, larger proposal more successful.”

The sheer variety of research areas represented is reflected in this participant’s comment about building a diverse research team: “How do you pick up a computational ecologist, a geologist, a microbiologist, an organic chemist, a computational chemist, and put them all under one grant? That takes some doing.” That’s exactly what the IdeasLab did.

Overall, the IdeasLab was successful in leveraging the strengths of researchers from a variety of disciplines to come up with ideas that would never have occurred to a homogeneous group. One participant summed up: “When you got people from different disciplines in the room, and asked them to think about new ways of doing things, what emerged wasn’t just one new idea about how the origin of life might have happened. Frankly, it was too many of those new ideas.”

OPEN MINDEDNESS

The IdeasLab demanded mental flexibility. The facilitators worked hard to help the participants create a space that welcomed the expression of diverse ideas. Characteristics and practices such as active listening, openness (to new ideas, approaches, and people), curiosity, risk-taking, creativity, and empathy all helped individuals navigate that unfamiliar (to some) space. While participants, funders, facilitators, and mentors arrived at the IdeasLab with some of these characteristics, their participation in the weeklong experience helped them practice and sharpen their skills and, in some cases, also allowed them to develop these skills *de novo*.

At the outset, the funders set the tone. One participant recalled them opening with a provocative statement: “Some of you probably came with ideas already prepared. We want you to throw those away, and we’re going to make new ideas.” This mindset was initially hard to swallow for some; one participant responded, “I’m not really sure what they meant by new ideas. I thought the problem was solved.” However, over the course of the week the participants’ minds opened to different ways science could be done.

“I am an engineer and I want to go first draft, second draft, final process sheet,” shared one participant, “so letting it be more of a cloud, and then finding the path through that is a change in the way that I think about things.” Another said simply, “I left knowing there is more than one way to do business.”

A mentor credited the uncertainty and ambiguity of the situation with its success. The IdeasLab “has made me wonder whether not having a script kept people paying attention,” they said, “and that led to better responsiveness to all the people in the room, and that contributed in some positive way to the kind of outcome they wanted.”

For some, the IdeasLab has continued to influence their work long after the workshop’s conclusion. “Even though I have not done any specific science

based on this,” one participant shared, “it definitely left an impact on the ways I think about developmental projects.”

How did they get there? “I learned to let go of my ideas and battle plan in order to get along with others with different views,” one participant said. Another learned to “not restrict my thinking to what was plausible” in order to broaden the spectrum of ideas brought to the table in the first place. Another needed to be confident that “I could share my thoughts freely without worries I’d be ridiculed or criticized.”

One funder emphasized the mental shift from associating oneself or others with a specific idea and arguing over whose to pursue, and instead “knowing that people are brilliant and intellectually curious,” and trusting the process to help the group converge on the best ideas the collective could generate.

“I learned to ‘let go’ of my ideas and battle plan in order to get along with others with different views.”

In the end, one participant “really enjoyed...being part of whatever experiment was being done on us.” Even the participant who early on thought the problem had been solved left saying, “Oh, I get it. My way of thinking has limits and there are many other ways.” That group’s mentor said, “I could not be more proud of him, his group. The IdeasLab had opened his mind to realize the problem wasn’t solved.”

One participant’s parting comment indicated how valuable they had come to believe the IdeasLab process would be for scientists everywhere, despite, or perhaps because of, the challenging flexibility it required: “Can you bottle that and serve it to scientists everywhere?”



COMMUNITY AND RELATIONSHIPS

The IdeasLab took a relational approach, which was driven by the facilitators from the beginning. They set out to engineer a functional scientific community that would allow participants, mentors, and funders to communicate effectively, support one another, and break down traditional role barriers.

“The goal is to create a climate that intervenes on the collective behalf,” shared one facilitator, and to make adjustments in real time by “looking at the number of smiles and at body language, listening for tones...[and] paying attention to how people are experiencing the process.” That skilled attention allowed the facilitators to “flatten the hierarchy,” whether real or perceived, and foster an environment where everyone could grow positive, long-lasting relationships.

A successful IdeasLab with this structure requires participants to buy in to the facilitators’ process. That happened at this IdeasLab. While some participants entered with concerns that more senior scientists’ voices would overshadow their own, the facilitators’ activities (albeit cheesy at times) were effective in leveling the playing field. As one participant put it, “No one is an expert at drawing someone’s face in a paper bag, so it did bring people to the same level...You could then focus on following the facilitators’ prescription.”

“By the end of the first day, we all knew each other,” shared one participant. Taking time for that set the foundation for participants’ relationships to grow throughout the week, both with each other and with the funders. “I got to meet a number of important NSF and NASA program officers for the first time. These are incredibly important relationships for any professor,” one participant said. The opportunity to interact with new colleagues was especially valued by junior faculty. One early career participant explained, “The payoff is you get relationships with both other scientists and with program managers to whom you would not have had access.”

The selection of participants also played a role in successful relationship-building at the IdeasLab. One participant related feeling as if “the selection of the people in the IdeasLab was a slice of the most friendly and personable people in the field.” The innate dispositions of the participants, combined with skilled facilitation, created a community enriched with “energy and goodwill among the scientists, funders, and mentors,” according to one mentor.

Most simply, the IdeasLab “created a new community and new partnerships,” according to one mentor. Many of those relationships have continued to flourish into new collaborations, ongoing partnerships, and friendships. Relationships are sustained via email, phone calls, video conferences, science conferences, and professional meetings.

And yet, perhaps the best indication of the successful relational approach to the IdeasLab is that those relationships extended beyond the task at hand (generating novel, fundable scientific ideas) to supporting people in their everyday experiences as scientists.

At this IdeasLab, a participant shared, “People finally felt safe enough to approach somebody who was, four days ago, a stranger, and say, ‘Can I just talk to you about my situation because I need someone to talk to about this and I don’t know what to do? In 24 hours, I’m going to go back to my situation where I don’t have anyone in the community to go to.’”



COLLABORATION

The IdeasLab facilitated profound and sincere collaboration among scientists. Participants, funders, facilitators, and mentors described a predisposition among the group to collaborate. “It seemed like it was designed for people who like to collaborate with other people, and listen to other people, and bounce ideas off of other people,” a participant noted. It was—and the organizers selected participants carefully based in part on who might best work well with others.

“You want people who are going to genuinely collaborate; not ones who maybe add something in terms of being able to do the work, but aren’t really going to be formulating the ideas,” one funder said. “The people who see an idea and can quickly envision ways in which it plays out in different directions are good to have there, and a lot of people want them on their team,” another funder added.

It was not only the innate dispositions of the participants that made collaboration work. The facilitators and mentors intervened to support collaboration. “I was always thinking about raising up the person who we noticed sitting in the corner, being very quiet in the group,” shared one mentor. “There’s a lot of times where we’ll go up to a participant who we can just tell from their body language has something but they’re not quite comfortable saying it,” a facilitator added. “We’ll just approach him and ask what’s brewing,” which usually results in the person sharing their idea with the group. “Those kinds of things really do make a difference.”

Most scientists are used to thinking of grant funding as a competitive process, but the IdeasLab structure made it cooperative. After participants were selected, which was a zero-sum proposition, the process “was replaced with a coalitional form game or cooperative game,” one mentor said. In that situation, they continued “Your payoff is not what you can do competing with the other individuals here; it’s determined by the strength of the coalition you can make with something shared.”

As a result, a “really exciting and collaborative spirit” emerged, one participant reported. That spirit enabled a “snowballing” of collaborations “in a way that our normal interactions at meetings and other things don’t

necessarily lend themselves to,” another participant commented. That snowballing led to many participants feeling ownership of more proposals than they might have otherwise. “The way the collaboration builds, many people have had the same idea by the end of the week,” explained another participant, “so a lot of us feel that our ideas were selected, and that’s kind of the point.”

The collaborative process was highly successful in generating novel ideas. “It is hard to believe in a few short days we came up with new good ideas for research projects that individually we would not have thought of in a million years,” a participant shared. And beyond generating proposals that week, the collaborative nature of the IdeasLab has percolated deeper into the participants’ lives.

“People walked in thinking that they were going to walk out with funded proposals, and towards the end, they were saying wow, we need a research network,” a facilitator said. For some participants, that network is already developing. “I don’t think that after we complete the requirements of the grant we’ll stop collaborating,” a participant said. “I think we have the intention to continue working.”

The IdeasLab “did develop a nice community of researchers who have continued to maintain contact,” a participant reflected, “so in a way, it was bigger than any one of the grants.” The more scientists can connect via collaborative communities of this nature, the better it may be for the scientific enterprise; It enables the production of output that is truly greater than the sum of the individual scientists’ ideas and expertise.

“It is hard to believe in a few short days we came up with new good ideas for research projects that individually we would not have thought of in a million years”

INTENSITY

The IdeasLab was intense. Its design created challenging situations that stretched participants to new limits as they navigated loose and ambiguous structures. Those intense experiences, while sometimes difficult or painful, resulted in positive outcomes in many cases. “We all know it’s intense,” one participant reflected, “but when you’re pushed to the limit where you’re continuously generating ideas and revamping and letting go, maybe it helps you to realize something about yourself or about your way of thinking about science that wasn’t there before.”

The facilitators acknowledged that while not necessarily critical for success, in some situations the intensity and challenge of the IdeasLab enhanced the eventual output. “For that particular group, for that particular situation, the pain was something you had to go through in order to get to that good result,” one facilitator commented. Another stated “As a facilitator, my job’s to get them to a good outcome,” adding, “If that requires navigating them through some difficulty then that’s what it requires. If it requires creating difficulty, then that’s what it requires.”

The struggle participants experienced with the ambiguity and unfamiliarity of the IdeasLab’s structure became apparent when one participant made it known to the group that they felt overwhelmed, behind, and generally mystified by the entire process. “I was just like, if that’s where I’m supposed to be in this workshop, I’m not there. The facilitators are saying you should be doing this, and putting this together, and getting ready to do this. There’s no way, so I just stood up and said it,” they reflected. “Maybe the rest of these 30 people are feeling really comfortable with this...but I don’t feel like we’re in a good position at all.”

However, participants appreciated the intensity of the event in hindsight. “That

week was very intense, but in a way it was exactly what I want to do every week—with or without funding available. Just get in the room and talk to other scientists about exciting ideas in science,” one participant shared. Another participant suggested that future IdeasLab participants should “expect to be simultaneously happy, interested, stimulated, and frustrated,” and that the flux of emotions, including occasional bewilderment, might enable innovation. “I wonder if confusion is a necessary component of vulnerability which leads to good ideas,” they said.

The “emotionally and intellectually exhausting experience” of the IdeasLab, according to a facilitator, “is engineered to be different, which I think is part of why it’s wildly fun and successful, and why it’s wildly frustrating and ambiguous.” And even though “it was a very intense activity, both physically and emotionally,” one funder felt it had met its goal: “It produced highly original and interdisciplinary research proposals.” Still, though, they found themselves working to digest fully the incredibly intense week that was the IdeasLab: “I’m just still trying to ponder the complexity of it.”



INNOVATION

The IdeasLab embodied innovation from start to finish. It was deliberately designed to provide an opportunity for early and mid-career scientists to develop innovative approaches that are not constrained by dominant origins of life paradigms. The IdeasLab cohort was thus younger in age than the field as a whole.

“In a field where there are a lot of eminent scientists with dogmatic views, I was impressed to see no such people at the IdeasLab,” one participant shared. Several others echoed this sentiment, expressing gratitude for a space where there were no major power differentials between participants and no participants firmly entrenched in their views.

The organizers “were trying to find people who would think outside the box,” a funder said. Even if they were well-known in their subfield, “they weren’t lightning rods but sparks. We wanted the people who were going to spark a lot of different kinds of ideas.” That careful curation of participants fostered innovation.

The structure of the IdeasLab also enabled new ideas to emerge that might have been dismissed in other contexts. “Successful scientists are often good at coloring within the lines provided by funding agencies,” one participant said, “but here we were handed a blank piece of paper.” Another added, “We were given the structure and the focus to allow us to develop ideas that just would not have even been submitted to a normal funding program.”

By encouraging participants to start with big ideas, unencumbered by practicalities, ideas emerged that “were kind of like bar conversations, never really pushed all the way through to how we would actually test them,” a funder said. Then, because of the wide range of expertise in the room, the participants were able to generate methods “to test some of the more

influential ideas about the origin of life that have gone untested for decades,” a participant said.

The process worked. “We saw some proposals come out that were just radically new in what they’re trying to accomplish,” reported one funder. “In some cases the proposals were totally just like, wow, I never heard anything like that. That sounds really interesting!” added another. When it came time to make funding decisions, “the priority went to funding things that really were, we thought, earth shattering,” and there were plenty to choose from.

The participants, too, appreciated having a space to innovate and talked about the need for more such hands-on approaches to research funding.”It is inspiring that two federal agencies could come together to take this approach for asking fundamental questions of science,” one reflected. “I hope that these continue to happen. I think it will make a pretty big difference in people’s viewpoints to how they develop projects,” said another.

Not only did the proposals include radical new ideas, but developing the proposals helped individual scientists see themselves in new ways. “I am constantly amazed at the scientific project I was able to be involved with because, while I can see clearly now how I fit into it, if I hadn’t gone to the IdeasLab and met the people I did there,” a participant said, “I never would have worked on it in 20 years.”

Overall, the choice of participants and structure of the IdeasLab fostered innovation that led to “radical,” “earth-shattering” ideas that might not have arisen any other way. As one participant put it, “I think these are super positive things to come out of this kind of stuff.”

Suggestions for Future IdeasLab

Many of those involved in the IdeasLab shared ideas for improving similar experiences in the future. All agreed on the need to balance these recommendations with the primary intention of creating a relational, flexible, collaborative, interdisciplinary, innovative, and yet challenging environment so that the IdeasLab does not become overly structured.

One common theme involved approaches and behaviors that disrupted the relational nature of the IdeasLab. Participants particularly asked that facilitators, mentors, and funders pay more attention to and address instances of exclusion and/or “gaming the system.” The general, open question was whether facilitators could standardize procedures and protocols that encouraged everyone to notice and act upon these disruptive behaviors?

Cited instances of exclusion involved individuals (“By the time the proposal hit, I was booted off...and I’m like *how did that happen?*”) but also groups. One participant highlighted the Earth and geological scientists deciding “to be really insular and not play with others,” but reflected that perhaps this was because “they weren’t really being supported by other people.” Individuals in several roles also suggested that the mentor experience could be improved. Put simply by a funder, “The mentors are really critical and they don’t get anything out of it.”

In terms of gaming the system, many participants perceived that traditional academic and funding cultures disrupted the collaborative focus of the IdeasLab. “I think that a lot of people were concerned that they were going to be left out in the cold if they were on only one idea and it didn’t make it,” a participant said, so they joined many proposals.



Results varied. In some cases, participants “ended up on more groups than they wanted to be on,” according to one funder, “spreading themselves too thinly while pushing less established researchers to take charge of projects they did not feel ready to lead.” A participant confirmed this outcome: “Oddly...how I ended up as the PI on that proposal, because it was someone else’s total idea.” In other cases, more established researchers or those with a strong personality took over projects toward the end.

Participants, mentors, and some funders also identified information gaps, such as the unhelpful lack of knowledge of the “history of the field and maybe even efforts that were already funded by other grants,” that could be addressed to improve outcomes.” Others suggested additions to disciplinary representation (including auxiliary expertise such as engineers, programmers, and data scientists).

Participants further suggested that a greater focus on resources available at their institutions could have helped team development. “Teams formed around ideas, but when it comes time to write a proposal, it’s not just about the intellectual ideas,” one participant explained. Access to graduate students and instrumentation as well as researchers on campus, “were not necessarily touched on in depth or at all at the meeting, but came to be very important when it came time to write the proposal.”

The most widespread suggestions revolved around confusion or lack of communication concerning expectations before, during, and after the IdeasLab. Some reported a simple desire for greater clarity on desired outcomes. “It would have been nice to have a little more guidance on how to budget a proposal,” one participant said, “especially since so many of us were young researchers.”

Many went further, expressing a desire for sustained community-building after the week-long experience ended. For example, one participant noted that the IdeasLab was highly engineered, “but when we left, it was almost like we had to self-organize...I’d like to see that engineering extend further into the proposal preparation and implementation.” Another was surprised that the group was not told which projects had been funded. “I felt like we were brought into this together,” they said, “and we should know what the outcome was.” A facilitator reflected, “You kind of fall in love with the quirkiness of every individual that’s there, and then we lose touch with them.”

Participants and mentors expressed a particular desire to expand the innovation involved in the development of the ideas into the implementation phase. “This is very clearly a new way of developing scientific ideas. It is a new way of funding them,” one said, “so what would be nice to see is a way in which that newness could be extended to the actual completion of the project.”

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Looking Towards the Future

An overwhelming majority of those involved at the IdeasLab agreed that it generated and funded innovative, collaborative, interdisciplinary proposals unlikely to have emerged under traditional funding processes. A similarly strong consensus attributed this outcome to a skillfully managed event that combined equal measures of creativity and judgment (filtering). All those involved—funded or not—reported a valuable experience in terms of new ideas and relationships. Beyond these clear positives, and the short-term suggestions described previously, individuals from each role in the original IdeasLab converged on three aspects of the experience perceived worthy of improvement but requiring deeper change.

Diversity

While most agreed that “demographically, the IdeasLab was as diverse as could possibly be expected from the field,” many voices of mentors, funders, participants, and facilitators called for more intentional and long-term approaches to improve this diversity. “Women were underrepresented and there was one person of color, maybe two,” one interviewee noted, “and whether or not that is the research community out there, that’s not good enough.”

Gender Diversity

Consensus focused on the lack of recognition and appreciation for the knowledge and skills women brought to the IdeasLab. “Certain people didn’t participate as well with female colleagues as they did with male colleagues,” a female participant noted. In particular, “There were two guys...that talked over me constantly, that cut me off, didn’t really care what I had to offer.” Others suggested that underrepresentation at the IdeasLab in part reflected similar problems within the research field

as a whole. A mentor commented, more generally, that “you have to work harder to see those people because the world is not helping you see them, the way it helps you see others.”

Ethnic and Racial Diversity

Those interviewed suggested that the nature of this challenge differs from gender diversity. Quite beyond an issue that people of color in the field are marginalized, they are simply not present in sufficient numbers. The perceived need is to address this challenge earlier in the educational pipeline—in order to render participation at an IdeasLab possible. “When you have an absent pipeline, you can put all the suction you want on the output and...eventually...the three people in the community are overloaded to death,” a mentor said. “Understanding that, the challenge is to intervene earlier in the process.”

“The IdeasLab is a kind of Manhattan project—but what’s different is that all those people thrown together then stayed in one place. That last bit is important.”

Institutional Differences

A different way of thinking about diversity concerns the types of institution that were (dis)avored by the IdeasLab process and its associated funding. As one participant put it, “Unless there is some structure that encourages schools with smaller graduate/research presence, then good scientists from these places are at a disadvantage.” Concerns focused around differences in flexibility, especially timing, that correspond to the size of an institution and its ratio of research to teaching. “When we find out that we’re getting funded... We’re not like Harvard ...I can’t pull a graduate from a teaching assistantship onto a research line without having someone else to fill the teaching needs...I am excited by the ideas I have had a hand in generating, but people in my position need more lag time and/or support to adapt to such an innovative grant.”

Continuity

Participants, mentors, and funding officers all agreed they had been part of a fresh approach to generating and funding original research into life’s origins: New ideas, perspectives and relationships were born, and the event launched a new community of scientists and a new partnership between NASA and NSF. Will these novel initiatives be sustained over the months and years ahead? How? All interviewees agreed that much now hangs on the answers to these questions.

A sense of potential, but an equal measure of unresolved questions, came from all sides.

One funding officer observed, “A lot now hinges upon an active Research Collaboration Network involving all the participants to provide positive reinforcement for the energy and ideas launched in 2016.” A facilitator acknowledged, “Instead of saying we’re going to submit some proposals, maybe these people are actually saying they want to stay connected because this is the start of a career-changing experience.” A participant stated, “The IdeasLab has the potential to be a teenage summer romance: Once we returned home to our usual colleagues and our usual work, it takes a fight to avoid returning to old ways of doing business.” As one of the organizers suggested, “The IdeasLab is a kind of Manhattan project—but what’s different is that all those people thrown together then stayed in one place. That last bit is important.”

One of the social scientists who produced this report remarked, “This was a countercultural event, where the culture in question is academic research science as we know it in 21st century USA.” Her research skills are usually applied to explorations of agency, leadership and citizenship. Whether and how those values will be sustained by the community formed by the 2016 IdeasLab remains to be seen.

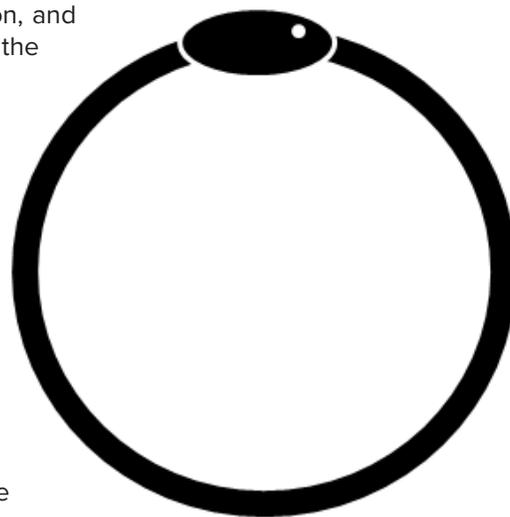
WHAT NOW?

Stories and images are presented in this report to provide insights but also to provoke new questions, for all readers, whether or not they were part of the original event.

This approach reflects the important idea that assessment is meaningful when viewed as the starting point for moving into the future, rather than the finish line for a past activity. New beginnings may include plans by funders or facilitators for further IdeasLabs on other topics. Equally relevant futures face participant scientists, who are busy developing new ideas and strengthening relationships formed by the original event. Other readers may find specific aspects for helpful reflection, inspiration, and application in very different activities. There is no one way to read the report and no one message it intends to convey.

As any one detail becomes useful to any one reader, summative assessment becomes formative assessment. Experiences and insights from specific individuals during a single week in 2016 become learning opportunities. A metaphor is Ouroboros—the ancient symbol of a snake eating its own tail, which often represents linear time folded back on itself to become a circle.

The team responsible for collecting feedback and producing this report has enjoyed its work and would be pleased to talk with anyone interested in using their services to explore a complex project, event or research activity. We also welcome feedback (freeland@umbc.edu) that can help us learn and improve our next project!



Feedback Workshop

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