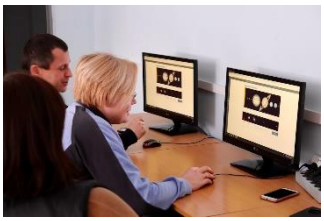
Science Voices

Annual Report

2020 - 2021



To Our Valued Partners and Supporters,

The last couple of years have been challenging, especially for start-up nonprofits. However, every challenge also presents opportunities. The global disruption caused by the COVID-19 pandemic has made visible the often hidden problems and inequities in digital education, especially in impoverished parts of the world.

The shutdown of international travel and in-person activities in 2020 put a damper on all of our planned activities for the year. However, the extended time in sequestration gave us the opportunity to pivot our projects in new directions and begin thinking through the basic digital infrastructure, innovations, and partnerships necessary to achieve our long-term ambitions.

So we have been hard at work regardless. Some highlights from the past couple of years include:

- An in-person public outreach event blending planetary science and sustainability at the Ak-Chin Indian Community Library in Maricopa, Arizona, USA (January 2020)
- An in-person workshop on digital teaching technologies for Ukrainian teachers at Lviv Polytechnic and University of Lviv in the western Ukrainian city of Lviv (January 2020)
- Development of the Agavi learning platform via hackathons (April – September 2020), presentation of a working prototype to partners at Etelman Observatory in the US Virgin Islands, USA, and the Geneva Lake Astrophysics and STEAM group in Wisconsin, USA (June 2021), and shortlisting of the project for the QS Reimagine Education Award in the category of Enhancing Access and Affordability (December 2021)
- Development of the Greenworks program for cooperative sustainability education with students at Khairun University in Indonesia, Lviv Polytechnic and University of Lviv in Ukraine, University of Campinas in Brazil, and Arizona State University in the USA (July 2020 – November 2021)
- Funding of two student groups in Indonesia to implement community environmental stewardship projects in Ternate, Indonesia (Summer 2020, Spring 2021)
- A small grant from the International Astronomical Union's Office of Astronomy for Development to implement a professional development program for students to incorporate astronomy into tourism businesses on St. Thomas in the US Virgin Islands, USA (December 2021)

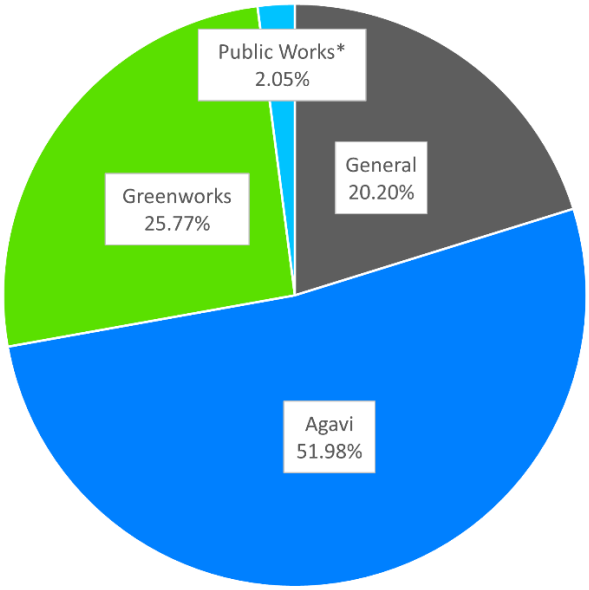
We're working in many places, but as you can see, all our projects converge on the same theme: using science and digital tools to provide opportunities for people to improve their lives. The past two years required a lot of behind-the-scenes groundwork. For 2022, we are well-positioned to capitalize on all of this work.

I hope you'll join us as we get started, and as always, thank you for your support through these challenging years!

Lev Horodyskyj
Founder, Science Voices

Funding Allocation by Project (2019 – 2021)

100% of funds from donations



***General** = funds for operations and prototyping*

***Agavi** = funds for Agavi platform development and implementation (Brazil, Indonesia, Ukraine, USA, USVI)*

***Greenworks** = funds for implementation (Brazil and Indonesia)*

***Public Works** = funds for implementation (USVI)*
*(*does not include Office of Astronomy for Development grant)*

Volunteers and Interns (All Projects)

Agavi (+6: Romania, USA, Pakistan, Germany)

Greenworks (+5: USA)

Public Works (+1: US Virgin Islands)

Instructor Partners (All Projects)

Brazil +1 | Indonesia +2 | Ukraine +1 | USA +2 | USVI +1

Students Impacted (Greenworks)

Brazil
+40 (Course)

Indonesia
+9 (Projects)

Ukraine
+10 (Course)

Awards (Agavi)

#EUvsVirus Hackathon
Finalists
Remote Working and Education
2020

Data Natives Unlimited Hackathon
Winners
Overall
2020

QS Reimagine Education Awards
Shortlisted
Enhancing Access and Availability
2021

Agavi

During our 2020 teachers' workshop in Lviv, Ukraine, it quickly became obvious that one of the biggest barriers to digital transformation in the classroom wasn't necessarily a lack of knowledge about what systems were available and how they work. Instead, it was the fact that many educational technologies (or "edtech" for short) are expensive to use and designed for high bandwidth environments. Alternatives to the "cutting edge" aren't usually designed to do much more than host videos, lecture slides, and quizzes. But we're in the 21st century now. We can do better than that.

Agavi is fundamental digital infrastructure we are developing to meet the needs of the teachers and informal educators with whom we worked both prior to and during the pandemic in a variety of challenging environments, from low-income teachers in Ukraine to low-bandwidth classrooms in Indonesia. This smartphone-first digital learning system allows teachers to use various "blocks" to construct "tasks" that can be linked together to form learning "experiences". The novelty lies in providing teachers with simple-to-use building blocks and tools that can be used to scale the complexity of their digital activities as necessitated by their teaching environment.

Agavi was born from a digital library idea that we were conceptualizing in 2019, where parts of activities were automatically substituted depending on a teacher's teaching location. In 2020, with the pandemic in full force, we used hackathons and other digital competitions to recruit a talented team from around the world to bring this idea to life, which culminated in a working prototype in June 2021, and a number of awards along the way.

People Involved

Lev Horodyskyj
Co-Lead

Bianca Ilca
Co-Lead

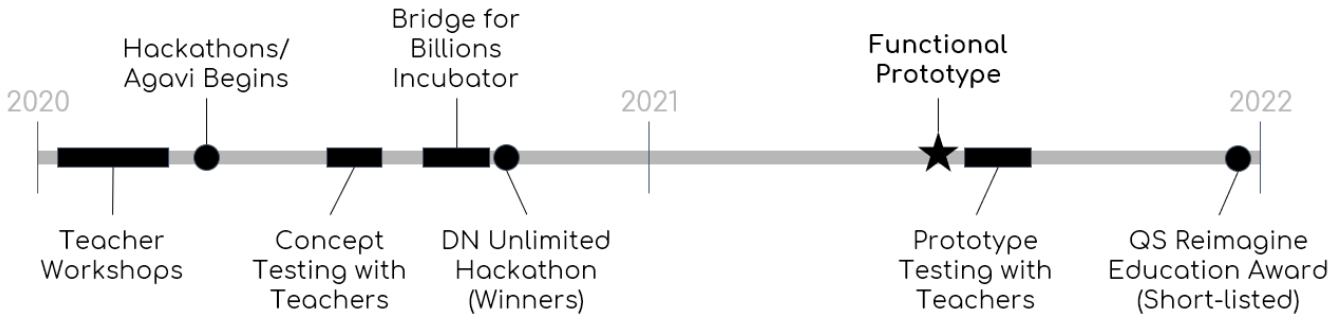
Alexandru Gazdac
Programmer

Jonathan Oribello
Data Analytics

Shahkar Hassan
Programmer, Data Analytics

Wayne Parkhurst
Programmer

Major Milestones



Partners

Blue Marble Space Institute of Science

Etelman Observatory
(managed by Orange Wave Innovative Science, LLC)

Looking Forward

After a successful initiation of the project, team-building, and prototyping of Agavi, we are looking forward to completing our preliminary work and beginning deployment of the system in select areas in 2022. Here are some of the important milestones we are aiming for with Agavi in 2022:

- Complete a beta version of the system for testing in select classrooms and public outreach initiatives in Brazil, Indonesia, Ukraine, USA, and US Virgin Islands
- Initiate an internship program (with preliminary testing in Romania and Brazil) to more easily on-board volunteers who want to contribute to the Agavi ecosystem (a format we will later use to launch hackathons and makerspace events that can allow the continued growth of Agavi as a learning ecosystem)
- Use of Agavi to implement public outreach programs in the US Virgin Islands in partnership with the Etelman Observatory in fulfillment of an International Astronomical Union's Office of Astronomy for Development grant awarded to Science Voices in December 2021
- An ambitious deployment of Agavi in the state of Amazonas in Brazil to addressed learning continuity needs in schools operating irregularly along the Amazon River

Supporting Agavi

The most important needs of Agavi in 2022 will be funding to help bring the system to fruition for successful deployment. Donations dedicated to the development and implementation of Agavi can be made via:

- Direct donation through the Science Voices website (https://sciencevoices.org/donate/)
- Donation to the "Science Classroom Modernization in Ukraine" project via GlobalGiving (link)
- Donation to the "Caribbean Astrotourism for Economic Development" project via GlobalGiving (link)
- Donation to the "Amazon River School Digitalization" project via GlobalGiving (link)

Additionally, Agavi is accepting volunteers who are interested both in helping build the infrastructure of the system as well as ones interested in individual deployments in challenging teaching and learning environments. Teacher testers can register their interest at https://agavi-ed.org/, while interested volunteers can contact us via https://sciencevoices.org/get-involved/.

Greenworks

The Greenworks program stemmed from a proposal to adapt a diplomacy role-playing college course to the Indonesian classroom during on-location work in 2020, which the pandemic put on hold. We instead worked to realize this plan remotely, and added a "public projects" component to help students adapt abstract classroom negotiation skills towards engaging community stakeholders during development and implementation of environmental stewardship projects important to local communities.

Currently, Greenworks is a Global North-South partnership program designed to teach students the basics of science and governance and how the two intersect to create public policy. During this program, students engage in a six-week curriculum where they role-play as leaders of fictional countries … challenged to understand the mechanisms of power and politics, analyze the wealth and paucity of resources available to them, and negotiate with other players to secure and protect their countries' interests and the well-being of the people they lead. Additionally, when funds permit, we directly fund student groups to implement an environmental stewardship project that they have developed (and that we have vetted) as part of required work necessary for their university degree.

We have funded two student groups in Indonesia, consisting of 4 students addressing waste collection problems and 5 students developing a composting business on the eastern Indonesian island of Ternate. We have also run the curriculum with 40 students in Brazil and 10 in Ukraine in a joint digital classroom as we worked to initiate them into the program. We are in the process of developing the digital infrastructure necessary to scale up this program in 2022, including a scenario simulator we are calling the "Decision Theater" and a website that will serve as a match-making hub between classrooms around the world.

People Involved

Lev Horodyskyj
Co-Lead (Science)

Tara Lennon
Co-Lead (Policy)

Lily Ishak
In-Country Facilitator
Indonesia (North Maluku)

Halikuddin Umasangaji
In-Country Facilitator
Indonesia (North Maluku)

Roberto Greco
In-Country Facilitator
Brazil (São Paulo)

Ihor Bubniak
In-Country Facilitator
Ukraine (Lviv)

Brian Kucich
Decision Theater
Scenario Design

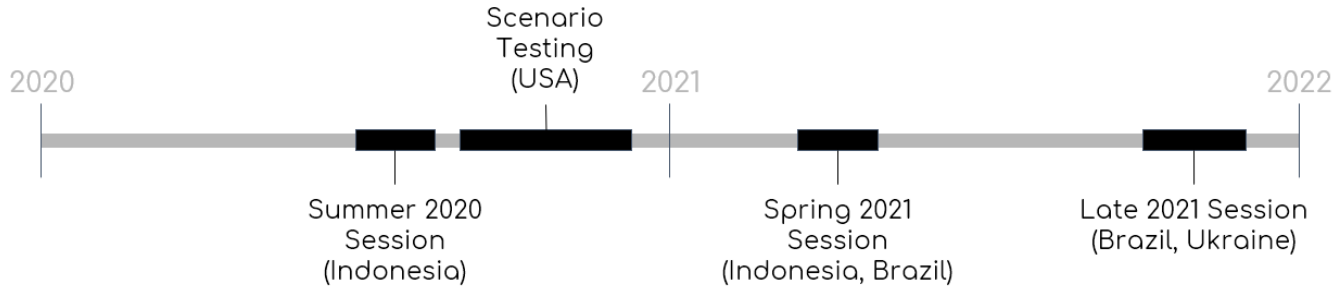
Caelan Langdon
Decision Theater
Programming

Daniel Orta
Decision Theater
Development

David Orta
Decision Theater
Programming

Patric Tipton
Decision Theater
Sound Design

Major Milestones



Faculty Partner Locations

Khairun University
(Indonesia)

University of Campinas
(Brazil)

Lviv Polytechnic
(Ukraine)

Looking Forward

The challenges in working across multiple universities around the globe simultaneously have been formidable. However, the two years of testing have paid off in a successful model that we are working to refine and scale. Here are some of the important milestones we are aiming for with Greenworks in 2022:

- Develop the digital infrastructure necessary to offer the Greenworks program at scale
- Complete 2-3 additional offerings of the program in 2022 with an expanded audience of high school students and working adults
- Develop CubeSat engineering and business coursework to complement the existing curriculum

Supporting Greenworks

Donations dedicated to the Greenworks project can be made in the following ways:

- Direct donation through the Science Voices website (https://sciencevoices.org/donate/)
- Donation to the "Greenworks Indonesia: Student Projects Fund" via GlobalGiving (link)
- Donation to the "Amazon River School Digitalization" project via GlobalGiving (link)

Additionally, Greenworks is accepting partner classrooms who are interested in participating in the curriculum. Interested teachers and students can register their interest at https://sciencevoices.org/greenworks/.

Public Works

A critical component of comprehensive science education is to reach learners of all ages who are either not picking up critical interdisciplinary skills in the classroom or have left the classroom decades ago and are no longer formally learning science, either the process or the information discovered by the process.

2020 and 2021 were challenging years for in-person public science activities. Our only event during this period was in January 2020, when we completed a Mars settlement activity with the Ak-Chin Indian Community Library in Maricopa, Arizona, USA. During this event, Indigenous children and their families learned about soil science, greenhouses, and solar panel sizing and angling, then used those skills to build and place a model greenhouse on the surface of Mars. Although attendance was small because of the holidays, the families who attended enjoyed the activity.

In 2021, we began working more formally with the Etelman Observatory on St. Thomas in the US Virgin Islands, USA. Using the Agavi prototype in the summer of 2021, our student intern developed and investigated the effectiveness of an interactive tour of the observatory grounds as part of her project for the Emerging Caribbean Scientists program at the University of the Virgin Islands. In 2022, we will continue developing innovative public outreach events with the Ak-Chin Indian Community Library, the Virgin Islands Children's Museum, and various USVI businesses as part of a new grant we received from the Office of Astronomy for Development.

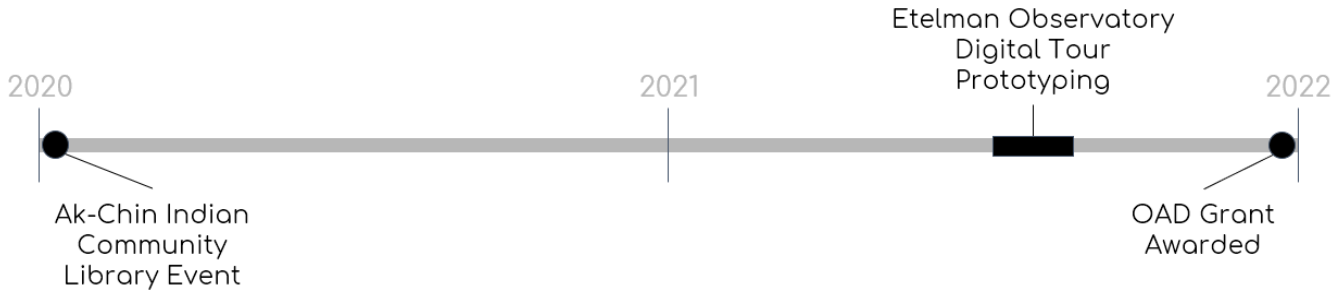
People and Partners

Ak-Chin Indian Community Library
(Arizona, USA)

Etelman Observatory
(US Virgin Islands, USA)

Nikita Beck

Major Milestones



Looking Forward

As the Agavi system comes online, we'll be empowered to expand the scope of our public works program, as Agavi will form the underlying digital infrastructure of the experiences we co-develop with our partners. Additionally, we will begin exploring programming and activities for different demographics to engage a wider audience in lifetime science education. Here are the major milestones we will be working towards in 2022:

- A podcast on science education and outreach around the world (Global.Science), with a targeted 10-15 episodes for the first season
- Implementation of the Office of Astronomy for Development grant with the Etelman Observatory and local businesses in the US Virgin Islands, USA
- Develop stronger collaborations between informal education groups through the use of Agavi, including the Etelman Observatory, Ak-Chin Indian Community Library, and the Geneva Lake Astrophysics and STEAM group
- Prototype a Silver Science program utilizing either Greenworks or Public Works materials to develop science-infused activities for working professionals and retirees

Supporting Public Works

In order to implement our various public works, we require partners who are interested in conceptualizing and implementing active-learning science activities using a mixture of hands-on materials and prototype digital learning tools. Interested partners can contact us at https://sciencevoices.org/get-involved/.

Funds to help prototype new experiences, as well as supporting projects currently being implemented are also welcome:

- Direct donation through the Science Voices website (https://sciencevoices.org/donate/)
- Donation to the "Caribbean Astrotourism for Economic Development" project via GlobalGiving (link)

Partners and Major Supporters

Partners

Blue Marble Space Institute of Science
Ak-Chin Indian Community Library
Etelman Observatory
Orange Wave Innovative Science, LLC
Geneva Lake Astrophysics and STEAM

Dr. Ihor Bubniak (Lviv Polytechnic, Ukraine)
Dr. Halikuddin Umasangaji and Dr. Lily Ishak (Khairun University, Indonesia)
Dr. Roberto Greco (University of Campinas, Brazil)

Major Supporters

International Astronomical Union's Office of Astronomy for Development
European Geosciences Union

Fabia Battistuzzi
Ivan and Luba Horodyskyj
Lev Horodyskyj
Bianca Ilca
Benjamin Kibel
Paul Price

Join Our Journey

A heartfelt thank you to all the donors and volunteers who have contributed their time, expertise, and money to our cause. If you would like to join us on this journey, you can contact us at https://sciencevoices.org/get-involved/. Additionally, you can follow us at our websites and social media channels.

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