

## CALL FOR PROPOSALS

# 2022 Grant Competition

Through an annual grant competition, the **Battelle Engineering, Technology and Human Affairs (BETHA) Endowment** supports programs that examine the impact of science and technology on people and society.

Full-time assistant, associate and full professors (with a minimum 75% appointment for a nine or 12-month period) are invited to submit proposals to be considered for Battelle Endowment funding.

The Battelle Endowment committee is seeking outstanding proposals that influence future leaders to become more knowledgeable about, and engaged with, the relationship between science and technology and broader social and cultural issues. Projects that bring together expertise from two or more disciplines or institutional partners, and those that envision collaborative opportunities for faculty, students and community members are encouraged. Projects that address engineering-related topics or feature collaborations between engineering and the social sciences or arts/humanities are particularly welcomed. Proposals that involve pure research or seek only to acquire or use technology (e.g., to purchase computers or other equipment) rather than explore its impact on broader social issues, are not generally competitive.

The Battelle Endowment typically supports three to six new projects each year, with award amounts ranging from \$10,000 to \$60,000. Evidence of other support (e.g., matching funds) is encouraged and preferred. BETHA grants are typically awarded for a period of two years. Multi-year projects will be considered in exceptional circumstances, with subsequent funding contingent upon demonstrated and acceptable performance during the initial two-year grant period.

Awards are announced in the spring with project start-up the following autumn semester. All awards are administered by the Office of Research, and final budgets are subject to the approval of the Office of Research fiscal officer.

Proposals are reviewed by a committee consisting of Ohio State University faculty members and the senior associate vice president for research. In selecting programs for funding, the committee seeks projects that will best fulfill the goals and spirit of the Battelle Endowment. The committee uses the following criteria to evaluate proposals:

- Does the proposal address the goal of helping scientists and engineers become more sensitive to the human impacts of technology, and/or help further the understanding of the capabilities and limitations of science and technology?
- Does the proposal offer specific activities for mentoring future leaders?
- Does the proposal include an outreach component (e.g., a plan for dissemination of what is learned that has relevance beyond the university community)?
- Is the proposal realistic in goals and timeline?
- How likely is it that these goals will be achieved?
- Does the project team include the necessary expertise?
- Is the budget reasonable to accomplish the project goals?
- Is the proposal well organized to accomplish the project goals?
- Will the project be supported by proposer's academic unit? (The level of support given by proposer's department and/ or college is viewed as important to the success of a Battelle Endowment project.)

## Instructions for Submission

For questions prior to submission, contact:

**Cheryl Cahlander**

Office of Research

208 Bricker Hall, 190 North Oval Mall

[cahlander.2@osu.edu](mailto:cahlander.2@osu.edu)

614-247-4764

Instructions for submission of nominations and forms can be found at: [go.osu.edu/BETHA2022](http://go.osu.edu/BETHA2022)

Deadline for receipt of proposals is **Friday, December 3, 2021 at 5 p.m.**



# BETHA Submission Instructions

208 Bricker Hall  
190 N. Oval Mall, Columbus, OH 43210-1016

## Instructions

- Please email a single PDF of all materials to [betha@research.osu.edu](mailto:betha@research.osu.edu)
- Deadline for receipt of proposals is **Friday, December 3, 2021 at 5 p.m.**
- Late, incomplete or improperly formatted proposals will be returned without review
- If your research involves the use of human or animal subjects, you must submit the necessary paperwork or protocols to Ohio State's Office of Responsible Research Practices. They can be reached at 614-688-8457, or visit [orpp.osu.edu/](http://orpp.osu.edu/)

## Battelle Endowment proposals must include all of the following:

1. **Cover Page** (*Use form provided*)
2. **Project Narrative** (*Not to exceed 1,500 words*)

The main body of the proposal should be double-spaced and not exceed 1,500 words. Documents should be composed in an easy-to-read font (e.g. Arial). The project narrative should be written for a general (i.e., non-specialist) audience, as the review committee is composed of faculty from across the university representing a wide range of disciplines. At a minimum, the narrative should address the following:

**a. Description of the Project:**

- The problem to be addressed and its importance and relevance
- The audience to be reached and the means by which it is to be reached
- The likely effectiveness of this means of addressing the problem
- The characteristics of a lasting product of the project, if any
- If the project will result in a product or publication, a plan for its dissemination
- If the proposed activities are part of a larger project, discuss the project's history and any plans for the future, including organizing support. Letters from the principles of this larger project must be included.

**b. Discussion of Relationship to the Battelle Endowment Mission:**

The primary mission of the BETHA Endowment is to help scientists and engineers become more sensitive to the human impacts of technology, and to create a better understanding of the capabilities and limitations of science and technology to address societal needs.

**3. Budget Form and Budget Narrative**

**a. Budget Summary Form** (*Must use form provided*)

**b. Budget Narrative** (*one page*) Provide same format as Project Narrative giving a brief narrative of the major line items to be funded by the Battelle Endowment. The narrative should be on a separate page immediately following the detailed budget form.

Note:

- Personnel costs should be based on accurate current levels for salary and benefits obtained from the fiscal officer of your academic unit.
- Personnel must be justified in terms of their specific tasks related to the project
- The Battelle Endowment does not fund faculty release time or summer salary
- The Battelle Endowment does not fund overhead or indirect costs

See the following websites for additional information:

- Tuition: [registrar.osu.edu/FeeTables/MainFeeTables.asp](http://registrar.osu.edu/FeeTables/MainFeeTables.asp)
- Benefits: [hr.osu.edu/benefits/](http://hr.osu.edu/benefits/)
- Equipment costs should reflect estimates based on current market prices. For example, if purchasing a computer, please consult with an Ohio State-approved vendor for specific prices, with the understanding that prices may change between the submission of your proposal and the awarding of a grant. On the budget narrative page, please justify briefly why such equipment is unavailable to you, or why a dedicated piece of equipment is required for this project. All hardware purchased becomes the property of your academic unit, which assumes all responsibility for future maintenance and upkeep. The Battelle Endowment does not provide funds for ongoing maintenance or support.

Note Cont.:

- Travel costs also need a brief justification, with expenses consistent with current university guidelines for transportation and per diem
- Please note that all budgets are subject to final approval before an award is made, and a revised budget may be requested by the committee. All-or-nothing budgets may hinder the competitiveness of your proposal.

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**4. Biographical Sketches (1 page each)**

Provide a one-page biographical sketch for each project participant, starting with the project coordinator. These should indicate his/her qualifications for carrying out the project, including the standard curriculum vitae information, a list of a few recent and relevant publications or other scholarly works and a brief description of any experiences relevant to this proposal. Please do not send a biographical sketch longer than one page.

**5. Letters of Support**

Include support letters from:

- The chair of the project coordinator's academic unit
- The dean of the project coordinator's college
- Each collaborator outside the university indicating their willingness to participate and describing any resources they will bring to the project

Missing letters, especially from deans and department chairs, will result in disqualification of the proposal.

**Letters of support should be addressed to:**

Battelle Endowment Selection Committee  
The Ohio State University  
Office of Research  
208 Bricker Hall  
190 North Oval Mall  
Columbus, OH 43210



# Frequently Asked Questions

208 Bricker Hall  
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## **How often is the competition held?**

BETHA is an annual competition. The submission deadline for 2021 proposals is **Friday, December 3, 2021 at 5 p.m.**

## **How many grant applications are received each year?**

The number of applications varies from year to year. Past years have seen as many as 40 and as few as 17 submissions.

## **How many grants are awarded each year?**

Typically, three to six projects are funded each year, depending on available funds.

## **What is the usual Battelle Endowment grant award?**

Awards range from \$10,000 to \$60,000 for a two-year project.

## **When will grant winners be announced?**

Award announcements are made in mid-to-late March.

## **If my project is selected for funding, when will the funds be available?**

Fund are transferred to the project coordinator's college/department for distribution as of July 1 of the award year. (i.e., for awards announced in the spring of 2022 funds will be available on July 1, 2022)

## **Can adjunct or part-time faculty apply?**

No. Only full-time assistant, associate and full professors (with a minimum 75% appointment for a nine or 12-month period) can apply for Battelle Endowment funding. However, adjunct, part-time faculty or permanent staff may serve as part of the project team.

## **Do I need to submit an electronic copy of the proposal?**

Yes. This entire proposal must be sent electronically as a single PDF document to [betha@research.osu.edu](mailto:betha@research.osu.edu).

## **How long should the biographical information be for each investigator?**

No longer than one page (one-sided).

## **Can the project narrative be more than 1,500 words?**

No. If you choose to include references/graphics/figures/footnotes, they must fit within the 1,500 word limit (approximately five pages). However, additional essential supporting information can be posted on a website and the URL included as part of the 1,500 word limit.

## **Should I send the support letters separately?**

No. All support letters must be included with your application packet.

## **Who should write the letters of support?**

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Support letters must be included from the project coordinator's department chair and dean. (If you are a department or unit chair, request a letter from your dean.) If your project involves collaborators from outside of Ohio State University, include letters from them stating their commitment to the project. Regardless of your position, you are not permitted to write your own letter of support.

## **If my proposal includes faculty from multiple colleges and departments, do I need to submit support letters from the chairs and deans of each college/department?**

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No. A support letter is required from only the project coordinator's department chair and dean.

## **Is there a template for support letters? If not, what information should be included?**

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No, there is not a template for support letters. An adequate support letter will address (1) the merits of the project, (2) its potential benefit or impact on the department/college and beyond, (3) confirmation that the college/department supports the project, (4) the confidence that the project coordinator can successfully complete the project.

## **If I have received a Battelle Endowment grant in the past, can I apply for a new grant?**

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Yes, however, you must wait one (1) year after submitting your final report for the previous project before applying for a new grant.

## **I was a co-investigator on a BETHA grant awarded last year. Am I eligible to submit a proposal this year?**

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Yes. Provided you were listed only as a co-investigator, you may submit your own grant proposal this year.

## **Can I submit more than one proposal?**

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Yes. There is no limit to the number of proposals which can be submitted by one individual.

## **Can I apply for a multiple-year grant?**

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Battelle Endowment grants are usually for a period of two (2) years. If special circumstances require additional time for your project to be completed, please clearly explain these in the project narrative and the committee will take this into consideration.

## **Is there a specific format to be used for the budget?**

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Yes. The required pre-formatted budget template is provided for you in a fillable PDF format. If you require the budget form in a different format, please contact the BETHA Coordinator at [betha@research.osu.edu](mailto:betha@research.osu.edu) or 614-247-4764. Grant proposals submitted using other budget forms will not be accepted.

## **Does the grant require matching funding sources?**

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No. However, matching funding sources are strongly encouraged. Matching funds can be made by your department or by partners outside of the university, and can be either cash or in-kind contributions. Please make sure that the source and type of matching funds are clearly itemized in your budget.

## **Does the grant allow indirect costs on the budget?**

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No. Overhead or indirect costs are not allowable budgetary items.

## **If I plan to hire a graduate student, do I need to include tuition and fees?**

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Yes, unless you arrange to have these costs covered by your department or college. Use the following guidance:

- If the graduate student(s) will be hired for 50% time on this grant, include costs for 100% of their tuition and fringe benefits
- If they will be hired for 25% time on this grant, include costs for 50% of their tuition and fringe benefits

## **What is the cost of tuition and fees?**

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Check with the fiscal staff in your department to determine the exact amount necessary for your field. Please refer to the registrar's website for the most current information regarding tuition and fees. [registrar.osu.edu/FeeTables/MainFeeTables.asp](http://registrar.osu.edu/FeeTables/MainFeeTables.asp)

## **Do I have to pay fringe benefits for all employees hired through this grant?**

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The university subsidizes a portion of health insurance costs for graduate students. If you are hiring a graduate student, check with your department's fiscal staff to determine the exact amount for fringe benefits.

## **What if I overspend my grant funds?**

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If your account is overspent, it is the responsibility of your department to repay the Battelle Endowment.

## **What if my research involves human or animal subjects?**

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Research involving human or animal subjects must be approved by The Ohio State University's Institutional Review Board (IRB) or Institutional Animal Care and Use Committee (IACUC). For more information, contact the Office of Responsible Research Practices at 614-688-8457 or refer to their website at [orpp.osu.edu/](http://orpp.osu.edu/).

## **Who is on the Battelle Endowment committee?**

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Committee members are current Ohio State University faculty members from a variety of disciplines. Many are past Battelle Endowment grant recipients.

## **What happens to the materials and equipment purchased through a Battelle Endowment grant?**

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All materials and equipment purchased are the property of The Ohio State University. At the end of the grant period, all equipment and unused materials and supplies (regardless of the cost) will be handled by the project coordinator's college or department.

## **Are there any tips you can offer to help improve my chances of being awarded a grant?**

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- Double check the math on your budget form
- Make sure your application clearly explains how your project fits the Battelle Endowment mission
- Request letters of support from department chairs and deans well in advance of the deadline. Proposals submitted without these letters will not be accepted.

## **What if I still have questions?**

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Contact the Battelle Endowment coordinator at [betha@research.osu.edu](mailto:betha@research.osu.edu) or call 614-247-4764.

## **Proposal Deadline: Friday, December 3, 2021**

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Proposals for the 2022 competition, including the required letters of support, must be received by 5 p.m. on Friday, December 3, 2021. Late or incomplete proposals, or proposals that do not conform to the required format, will be returned without consideration. Please read the Submission Instructions for specific information about submitting proposals.

## **BETHA Workshop**

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Again this year we will offer a workshop for those who may be considering submitting a proposal. This one-hour session will feature a panel of past BETHA recipients and review committee members who will share tips for writing a successful proposal and discuss criteria used in the review process. Watch for more information and registration link coming soon.

## **Contact**

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For questions or more information, please contact:

Battelle Endowment Coordinator

Office of Research

208 Bricker Hall

190 North Oval Mall

Columbus, OH 43210

Phone: 614-247-4764

E-mail: [betha@research.osu.edu](mailto:betha@research.osu.edu).



# History of Battelle Partnership with The Ohio State University

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## History of the Partnership

Since its first recorded gift to Ohio State in 1954, Battelle Memorial Institute's generosity has enabled Ohio State to accelerate research in fields as diverse as medicine, engineering and contemporary public policy.

The Battelle Endowment for Technology and Human Affairs, established in 1975, supports activities that help scientists and engineers become more knowledgeable about and engaged in the relationship between science and technology and broader social and cultural issues. Participants in the program's initiatives have numbered in the thousands—including Ohio State faculty, staff and students; Battelle colleagues; specially invited international luminaries; and members of the central Ohio community.

For the first 10 years of its existence, the program provided for a major symposium, as well as seminars and meetings on general topics connecting science and technology with the quality of life in the contemporary world. A hallmark of the early symposia and related activities was their broad interdisciplinarity. The inaugural Battelle Endowment symposium, "Energy, Environment and Our Society," included a professor of economics from the University of Colorado who, at the time, was also the president of the American Association for the Advancement of Science; the vice president for science and technology at Exxon Corporation (now, ExxonMobil); the dean emeritus of the John F. Kennedy School of Government; the chief economist of the Atlantic Richfield Company; the former ambassador to Saudi Arabia; and the president of the National Audubon Society. The complementary faculty seminars included representatives from such diverse disciplines as law, agricultural economics, sociology, nuclear engineering, philosophy, economics, public administration, history, zoology and political science.

The program format has changed since its earliest days, but the focus remains the same. In 2012, program administration moved from the Office of Academic Affairs to the Office of Research. At Battelle's request the fund was renamed the **Battelle Engineering, Technology and Human Affairs (BETHA) Endowment**. Today, the Battelle Endowment supports such initiatives as public lectures, art exhibits, workshops and interactive computer projects that examine the complex relationship between science and technology and the needs and aspirations of individuals and society.



# BETHA Previously Funded Projects

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## 2021

### 1. The SciAccess 2021 Conference

*John Beacom (Department of Physics, Department of Astronomy)*

Science, with its universal laws, belongs to everyone, but access is not universal. The SciAccess 2021 conference will focus efforts to increase access to science for individuals with disabilities. We will bring together a broad spectrum of researchers, educators, advocates, and students to raise awareness, share best practices, and make connections. Building on the successes of the 2019 and 2020 conferences held at Ohio State, in 2021 we will start to build a coalition of institutions to grow the reach of SciAccess, both as a yearly conference and a year-round community. This will assist individuals, strengthen society, and enrich science.

### 2. Color Field: Robotic Painting with Students at "Camp Architecture"

*Ashley Bigham (Knowlton School of Architecture)*

Students considering a career path in architecture, especially those from underrepresented backgrounds, are typically unacquainted with the innovative tools altering the way we design and build cities. Research shows that hands-on experience and early exposure is critical to attracting underrepresented students to STEM fields like architecture. Robotic field painting is a collaborative activity offering aspiring architects hands-on experience with geospatial and robotics. Working with community partners Camp Architecture and Waterman Farms, this project invites middle and high school students to gain invaluable experience with tools that are revolutionizing architecture and its allied fields including landscape architecture and urban design.

### 3. Ohio's Coal Transition: Pathways for Community Resilience

*Jeffrey Jacquet (School of Environment and Natural Resources)*

Combining social science, engineering, theatre, and art we propose to explore, understand and document specific and generalizable impacts of the ongoing energy transition away from coal on three rural Ohio case study communities. Our research findings, practitioner reports and community tool-kits will inform policies, programs and design aimed at bolstering community resilience in these communities and beyond. Our creative outputs in theatre and art will build creative capital and bring public awareness to the human and community-impacts of energy systems. Our community partners will ensure the collection of quality data, the usefulness and reach of our academic and creative works.

### 4. A Fundamental Shift in Thinking About Trees

*Steve Lyon (School of Environment and Natural Resources)*

Visualizing the impacts of environmental restoration is challenging. For example, when we plant trees it can take a generation before they reach full size and influence environmental health. How can we excite communities about something that takes a lifetime to achieve? We will develop augmented reality visualizations to let stakeholders not only see but also experience what different configurations of trees and environmental impact data would be like at specific locations. Working in Cleveland, our plan is to interlace BIPOC community information needs with our technological abilities to create a series of prototypes that empower future generations of environmental stewards.

### 5. From Classrooms to Communities: Fostering Youth Activism and Civic Engagement Through Case-Based High School Biology Curriculum

*Jennifer Rodis (College of Pharmacy)*

Visualizing the impacts of environmental restoration is challenging. For example, when we plant trees it can take a generation before they reach full size and influence environmental health. How can we excite communities about something that takes a lifetime to achieve? We will develop augmented reality visualizations to let stakeholders not only see but also experience what different configurations of trees and environmental impact data would be like at specific locations. Working in Cleveland, our plan is to interlace BIPOC community information needs with our technological abilities to create a series of prototypes that empower future generations of environmental stewards.

## 2020

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### 1. Can Novel Technologies Promote Social and Ecological Resilience to Novel Disturbances in a Changing Arctic Climate?

*G. Matt Davies (School of Environment and Natural Resources)*

The Arctic is the most rapidly warming region on Earth and new types of disturbance, including wildfires, have the potential to further disrupt communities and ecosystems. Wildfire was historically rare in Greenland but large events are becoming more common. Here, wildfire is a novel disturbance and socio-ecological systems may lack resilience. Our interdisciplinary team will work with local stakeholders to evaluate technological solutions for mitigating arctic wildfire risk. To do so requires understanding how stakeholders perceive of, and interact with, technology to ensure tools do not supplant local and traditional knowledge, or negatively impact highly-valued personal and communal autonomy.

### 2. The Scientist Next Door: Making STEM Accessible Through Storytelling

*Lisa Hall (Chemical Engineering, STEAM Factory)*

It is imperative that universities translate scientific expertise into accessible language for a broad audience in a way that creates lasting compelling and personal connections to the research and humanizes the process of science. This project seeks to strengthen the science storytelling capacity within the Ohio State research community via professional development, live performance, video development and public outreach initiatives. Through these activities, this project will significantly benefit participating researchers as well as the general public. This project has the potential to have a substantial ongoing impact by further integrating science storytelling into existing university infrastructure and Columbus community.

### 3. Using Hyve-3D Immersive Virtual Environment System to Facilitate Engagement in Public Participation Activities

*Sébastien Proulx (Design)*

Relying on the Hyve-3D social virtual reality system, this project will establish a Digital Public Participation Lab, to facilitate lay people engagement in the decision making process. This system provides a visualization and rapid-prototyping medium to support engagement in public participation activities. As such, this research focuses on the potentialities of an emerging technology for social and community development. Through this VR system, our initiative sought to make people capable of envisioning the impacts certain decisions may have on their daily lives. As a prototyping tool, the Hyve-3D also provides a promising democratic and community empowerment mechanism making anyone capable of becoming an active stakeholder in the design decision impacting their daily life.

### 4. A Collaborative Digital Gaming Platform for Children with Disabilities Using Human-Centered Technology and Touch

*Scott Swearingen (Design)*

Families who care for children with disabilities experience more challenges interacting with their children than families with normal children. This increased level of burden results in higher rates of emotional stress and hardship for families. With over 5.5 million children in the United States with physical or cognitive disabilities, our proposal aims to create a collaborative digital gaming platform using human-centered technology that normalizes the experience of play between the fully-abled and disabled to better serve these children, their families and communities. By emphasizing public engagement, our project merges the arts, humanities and technology, exemplifying the Battelle Endowment Mission.

### 5. DIY Science at COSI

*Laura Wagner (Psychology)*

This project will implement and fully assess a novel model of citizen science participation using the Language Sciences Research Lab at COSI. This model will emphasize a do-it-yourself (DIY) spirit of engagement, involving the general public in decision making at every level of the project, and is expected to improve attitudes towards science and appreciation of science as a process. The best-practices established by this project will be developed into a kit to be exported to other sites for expanded use.

## 1. MindUp! An e-Mental Health App to Support Homeless Youth's Mental Health

*Scottye Cash (Social Work)*

Approximately 75 percent of homeless youth experience some type of mental health disorders, however less than nine percent have ever received mental health services. Untreated mental health disorders can lead to a negative life trajectory, including suicidal behaviors. This project will partner with Star House, a central Ohio drop-in center for homeless youth, to design and test a web-based app to provide an evidence-informed, one-stop resource for local mental health resources for depression and anxiety. MindUp! will serve as an innovative tool to reduce these youth's barriers to seeking mental health support, to improve their well-being and reduce suicidal behaviors.

## 2. Inspiring Future Engineers through Girl Scout Leader Training

*Rachel Kajfez (Engineering Education)*

Despite years of effort, women have remained significantly underrepresented in engineering. This project will investigate how Girl Scout engineering badges and journeys impact girls' views of themselves as future engineers and, using this information, develop evidence-based training for Girl Scout leaders to support girls in their engineering development. Via the Girl Scouts, a large, diverse group of young women across the country will be exposed to engineering at a young age, and by training supportive leaders, this project will aid in closing the gender gap in engineering.

## 3. Adaptive Ambience Technology in the Preschool Classroom for Children Exposed to Trauma

*Kevin Passino (Electrical and Computer Engineering)*

Adverse childhood experiences (ACEs) are increasingly common, especially for children of color and those in lower-income homes. Children who have experienced ACEs enter the classroom on constant alert for threats which can interfere with their ability to learn and feel safe. This project aims to reduce trauma-induced stress in vulnerable children by developing adaptive ambience technology for the preschool classroom, as well as documenting stress levels in a diverse classroom of children ages 3 to 5 years and measuring the impact of adaptive ambiance on stress reduction for children.

## 4. A Machine for Reading: RLV2.0

*Robyn Warhol (English)*

Systems developers/engineers, librarians and English literature scholars are collaborating to build and populate the website Reading Like a Victorian 2.0. The site will enable users to read serial novel installments alongside parts of other novels that were published in the same month and year during the 19th century. The WordPress prototype currently online at victorianserialnovels.org will be replaced with new code, including a relational database for searching key elements of texts from Project Gutenberg and Hathi Trust – huge databases that have never before been indexed. years of effort, women have remained significantly underrepresented in engineering. This project will investigate how Girl Scout engineering badges and journeys impact girls' views of themselves as future engineers and, using this information, develop evidence-based training for Girl Scout leaders to support girls in their engineering development. Via the Girl Scouts, a large, diverse group of young women across the country will be exposed to engineering at a young age, and by training supportive leaders, this project will aid in closing the gender gap in engineering.

## 1. Monitoring Social and Economic Impacts of Green Infrastructure: Blueprint Columbus

*Jeremy Brooks (Environment and Natural Resources)*

Blueprint Columbus aims to improve water quality using green infrastructure (GI), but GI may also improve mental health, physical health and social relationships. Previous research has produced mixed results about whether and in which contexts GI can produce such benefits and has largely ignored whether the planning and implementation process affects perceptions of GI in a way that affects these impacts. This project will use interviews and focus group meetings in two Columbus neighborhoods to address these gaps by capturing local perceptions of the process and outcomes associated with GI installation.

## 2. Compact Browser-Based Reading Verification for Early Childhood Reading Fluency

*Eric Fosler-Lussier (Computer Science and Engineering)*

Repeated reading has been demonstrated to be an effective paradigm for improving reading fluency in early childhood learners. Computer-assisted technology can provide students with additional guided practice in the classroom, effectively augmenting feedback from teachers. This project will make reading verification ubiquitously accessible via a web browser and use advances in neural network deep learning techniques to improve the detection of reading errors. The proposed approach will also more easily allow reading passages to be personalized to the learner and better supplement classroom activities.

## 3. Data Science for Women Summer Camp

*Dorinda Gallant (Educational Studies)*

Exposing young women, especially underrepresented minorities, to data science and analytics (DSA) when they are starting to think about college and career paths (middle/high school) is one way to address the lack of diversity in this field. This project will launch a summer camp for young women in grades 8-10 recruited from Columbus City Schools, starting in July 2018 and annually thereafter. The camp will provide 30 young women with a wide variety of activities in DSA to encourage the students to consider DSA as a career choice.

## 4. The Global Sustainable Village

*Scott Shearer (Food, Agricultural and Biological Engineering)*

Ohio State students have a desire to positively impact humanity as part of their education. As they have undertaken humanitarian courses and projects to “to improve the human condition,” a gap has been identified between classroom learning environments and the field. To close this gap, a Global Sustainable Village (GSV) will be a physical focal point for this project work and provide an authentic setting for problem solving. The ability to develop technologies in a representative setting before field introduction will improve student learning, foster interdisciplinary collaborations, strengthen Ohio State-partner relationships and improve the impact of community development efforts.

## 5. DNA Workshops in Rural Ohio Schools

*Amanda Simcox (Molecular Genetics)*

DNA technology offers the next generation great job opportunities, and capturing interest early is critical for developing this workforce. Tenth-grade biology is an opportunity to expose students to hands-on experiences with DNA technology, but the lack of resources and teacher expertise means biology is often taught as a “book-science.” This project will engage Ohio State undergraduates on an alternative spring break, gaining valuable leadership experience while conducting outreach to this underserved population. These Ohio State role models will provide exciting science experiences, and also make college seem more reachable.

## 6. Engineering Design to Enhance Urban GEMS

*Deanna Wilkinson (Human Sciences)*

This project will engage Ohio State engineering undergraduates with urban middle school students to design and build a low-cost remote sensing system to facilitate deploying 36 indoor aeroponic growing systems dispersed on the south side of Columbus. The project will broaden the perspectives of Ohio State students by positioning them to utilize their skills to solve real-world problems and to experience firsthand the potential societal impact of technology. In addition, it will provide emergent exposure to STEM for middle school students in Urban GEMS and provide a technological solution to improve the aeroponic growing system.

## 1. Assessing Trustworthiness in Social Media

*Marie-Catherine de Marneffe (Linguistics)*

The rise of social media has created an information flood, but which information can be trusted? Factors including exact language used and the credibility of the source impact the veridicality of a statement. This project uses the analysis of veridicality and trustworthiness in social media as a gateway to engage students in linguistics and computer science. A course module will be developed to include introductory linguistics and programming assignments, culminating in an interactive demo that assesses the credibility of social media accounts and rates the veridicality of claims in social media.

## 2. Using Technology to Support Communication: Training Parent and Teacher Buy-in

*Allison Bean Ellawadi (Speech and Hearing Science)*

Approximately one percent of the population in the United States is unable to communicate effectively using spoken language. Alternative and Augmentative Communication (AAC) devices enable these individuals to communicate. Smart phone and tablet apps enable those devices to function as AAC devices, acting as the “voice” of an individual. Although the use of smart phones and tablets as AAC devices has increased awareness of and access to AAC, these devices continue to be abandoned/rejected. This project will investigate the impact of teacher and parent buy-in training on AAC use in school-age AAC users.

## 3. MAJI MARWA: Sustainable and Resilient Tanzania Community

*Michael Hagenberger (Civil, Environmental, and Geodetic Engineering)*

The Village of Marwa in rural Tanzania, with an estimated population of 5,000 – 7,000, is located approximately ten kilometers from the Pangani River, a permanent water supply with its source running off Mt. Kilimanjaro. Marwa lacks the technical ability and financial capacity to sustainably access and treat this water source. The Sustainable and Resilient Tanzanian Community (SRTC) program is an interdisciplinary, international development service learning initiative that brings together students from Ohio State University and the University of Dodoma, Tanzania’s largest public university, in leading-edge civil engineering and community development practice and local Indigenous resource management systems. Maji Marwa, or “Water for Marwa,” focuses on bringing clean, safe and accessible water to the village, while training the next generation of engineers, scientists and development workers in providing real-world solutions to real-world needs.

## 4. Community Gardens as Tools to Promote Science Education

*Maria Miriti (Evolution, Ecology, and Organismal Biology)*

Efforts to recruit students from underrepresented backgrounds into careers in evolution, ecology and organismal biology (EEOB) and other STEM disciplines commonly target undergraduates by providing research opportunities. However, these efforts have not appreciably increased the diversity profile of EEOB professionals over the past 20 years. This project applies Participatory Action Research (PAR) to engage youth at an earlier age in community gardening, a growing national movement that promotes healthy eating in food deserts while also empowering youth and promoting social change. Students interact with science professionals and youth from other communities to design and plan garden space, becoming immersed in science to explore human impacts on the environment and discovering pathways to STEM careers.

## 5. Shake the Shoe: Connecting Earthquake Science and Football with the Best Fans in the Land

*Derek Sawyer (Earth Sciences)*

Vibrations created by the 100,000+ fans during Ohio State football games can be recorded and analyzed just as an actual earthquake. The Shake the Shoe project will use seismometers to measure these “FanQuakes” at the Shoe. The data obtained will be used as an education and outreach tool about the science, technology and hazards associated with earthquakes. Classroom exercises, a publicly accessible website and interactive exhibits at COSI and other locations will engage and inspire current and future students and leaders.

## 1. Dance in Transit

*Harmony Bench (Dance)*

This digital humanities research project will employ data analytics to complete the historical record of modern dance performance in the first half of the 20th century. The project explores the relation between touring performers and the modes, networks and infrastructures of transportation that link cities, countries and cultures. The result will be a publicly accessible database extensively documenting an estimated 30,000 individual performances, and a digital scholarship on mid-century African American choreographer Katherine Dunham. Dunham conducted anthropological research in the Caribbean, transformed her ethnographic observations into choreographed works for the stage and toured domestically and internationally with her dance company.

## 2. Interactive Teaching Station for Child Restraint Installation

*John Bolte (Anatomy)*

The project will develop a hands-on educational station allowing caregivers to practice installing child restraints and receive personalized feedback. Motor vehicle accidents are a leading cause of death of children in the United States. Child restraint technology is effective at preventing death and injuries when used appropriately. Unfortunately, up to 93% of child restraints on today's roads are being used incorrectly. The station will include child restraints instrumented with sensors, an instrumented vehicle seat, instrumented dolls and an interactive computer interface. In addition to real-time educational feedback to the user, the software will record information about the users' errors during all installation attempts and provide these data to researchers.

## 3. The Philosophical Problem for Machine Morality

*Justin D'Arms (Philosophy)*

The project addresses the philosophical problem facing engineers designing autonomous machines: how to ensure that machines behave ethically. The team will conduct philosophical research to examine approaches to programming morality, develop educational materials to be used in the classroom and develop a conference at which local philosophers and engineers will be exposed to the best current work on issues about how to program machines for moral competence.

## 4. Creating Oral Histories by Fostering Digital Technological Literacies in Jamaica

*Valerie Kinloch (Teaching and Learning)*

A collaboration among Ohio State faculty, staff and students to collect and document oral histories and digital technological literacies of Black educators and students in Jamaica. Project goals are to increase access to digital technologies in a Black postcolonial community that has limited access to these tools, engage in community dialogues about oral histories and support exchanges about language, culture and digital technological literacies among participants in Jamaica and Ohio.

## 5. WindFarm

*Michael Mercil (Art)*

The project is an experimental artwork establishing a temporary (two year), 500 square foot, on-campus, green-energy park whose centerpiece includes a 70' tall, gold gilt wind turbine generating electricity to support the display of new video artworks in the Wexner Center galleries. WindFarm culminates a trio of Living Culture Initiative artworks at Ohio State, and will complete the rotation of this site from flowerbed to working garden, to orchard and livestock pasture, to carbon storage bank and green-energy park. Collaborators on the project involve the Department of Art, the Wexner Center for the Arts, the Office of Energy Services and Sustainability and the Social Responsibility Initiative in the College of Food, Agricultural, and Environmental Sciences.

## 2. The Revolution in Cosmology and Fr. Georges Lemaître's Hidden God

*Christopher Orban (Physics)*

An interdisciplinary study of the life, work and thought of the astrophysicist-priest who was one of the most remarkable figures of early 20th century cosmology. Lemaître helped lay the groundwork for the Big Bang theory, and his life and work represents one of the most interesting interactions between science and faith in the 20th century. The project will involve a collaboration between members of Ohio State's physics, astronomy and philosophy departments to develop coursework to teach about Lemaître and the wider context of his work, a student-led STEAM project to depict the expansion of the universe and public lectures on Lemaître's life, work and his philosophical and religious thinking.

## 2015

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### 1. The Columbus Sound Track Project: Engaging Citizen Scientists to Map Noise Levels in Columbus, OH

*Lawrence Feth (Speech and Hearing Science)*

Noise can deleteriously affect learning, quality-of-life, biodiversity and health. This project will use a citizen-scientist approach to create a noise-map of the Columbus metropolitan area. Members of the public with smartphones will be able to download a free app to measure noise levels tagged with GPS coordinates. COSI will host an interactive display allowing users to explore noise levels in different Columbus locations at different times of day. The display will also be available for exploration online. This project will engage the public in the scientific process and raise awareness of possible implications of different levels of noise.

### 2. Culturally Relevant Reading Instruction for Urban Learners Using Voice Activated Computer Assisted Instruction (CAI)

*Ralph Gardner III (Educational Studies)*

Reading is an essential skill for school success. Poor reading skills place children at risk for school failure and substantially impair long-term possibilities for social mobility and economic success. Currently, the state of Ohio mandates retention of all third grade students who fail the state reading tests. This research combines innovative computer assisted instruction (CAI) using voice recognition software and culturally relevant reading materials to improve the reading fluency and comprehension of first and second grade urban learners at risk for reading failure. The project is designed to demonstrate the effectiveness and applicability of this CAI intervention in urban schools.

### 3. Toy Adaptation Program: A Plan for Continuation and Growth

*Rachel Kajfez (Civil, Environmental and Geodetic Engineering and Engineering Education Innovation Center)*

Many engineering students struggle to connect engineering and societal impact. The Toy Adaptation Program (TAP) meets this need by providing hands-on engineering experiences (workshops, labs, and community service sessions) that allow students to apply their technical knowledge while adapting electronic toys for children with disabilities. While the experiences for students allow them to connect concepts related to circuits, soldering and reverse engineering to societal impact, the experiences themselves result in adapted toys that can be donated to toy libraries and families in need. These outcomes allow this program to not only benefit engineering students but also the community.

### 4. Mediated Spaces and Human Experience: Using Locative Technology to Enhance Presence and Place

*Maria Palazzi (Advanced Computing Center for the Arts and Department of Design)*

The One Ohio State Framework initiative recommends connecting ideas and information throughout the university. Enhancing connections between spaces and inhabitants supports this goal. Digital media and mobile devices augment our relationship to our environments with otherwise invisible evidence of history and culture. Seeding spaces with beacon technology will embed new layers of mediated information in Sullivant Hall to be delivered at contextually relevant locations, thereby exploring how locative technology as a form of presence design can best connect people with history, local culture and the university.

## 2014

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### 1. Student-developed Sustainable Housing Solutions in Central America

*Howard Greene (Engineering)*

Senior capstone students in multiple disciplines engage with university partners and residents in Honduras to develop and deploy a sustainable, replicable housing solution for the rural poor. Activities encompass conducting focus groups, developing concepts, designing and building prototypes, business plan development and building a pilot Honduran residence. The experience provides a transformational educational opportunity that fosters interdisciplinary collaboration while allowing students to comprehend firsthand the global context of the solutions they develop.

### 2. ITS STEM

*Joan Herbers (Evolution, Ecology and Organismal Biology)*

An Institute for The Study of Science, Technology, Engineering, and Mathematics (ITS-STEM) to serve as an intellectual hub for scholars who study the social, ethical, legal and educational challenges presented by science and technology. ITS-STEM will provide a forum for faculty to explore how the cultures of science and technology affect their work. Activities include a colloquium series, an outreach program and acquisition of external funding.

### 3. Harnessing Education and Technology for Environmental Detection (HEATED)

*Bryan Mark (Geography and Byrd Polar Research Center)*

A Maymester course where a diverse group of students design and build a device to collect geo- and time-tagged temperature data when deployed on moving vehicles, and to create a database, to store and assimilate data collected by the device. This project will result in a device prototype; an innovative, replicable course; data to better understand urban heat islands; and a multidisciplinary team prepared to continue research through other funding opportunities.

#### **4. Engineering, Technology, Human Affairs, and Social Justice: From Columbus to Colombia**

*Kevin Passino (Electrical and Computer Engineering)*

Engineering can improve “human affairs” by promoting social justice via new technologies tailored to the needs of disadvantaged communities, and education to build technological capacity. This project is focused on: (a) cross-cultural K-12 STEM Outreach in Columbus and Colombia; (b) technology development for people who are poor or homeless in Columbus; and (c) technology development for engineering laboratories in disadvantaged universities in Colombia. Results will be used in a course and book on humanitarian engineering.

## **2013**

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### **1. Narrowing Technology Gaps between Ohio State and Eastern Africa Using Mobile Electronic Data Capture and Analysis System for Zoonotic Diseases Research and Training**

*Wondwosen Gebreyes (Veterinary Preventive Medicine)*

This project aims to provide opportunities for Ohio State students and faculty members to conduct a research outreach using a Mobile Electronic Data Capture and Analysis System for monitoring foodborne pathogens in Eastern Africa. The proposed study aims to (a) narrow the technology gap and to facilitate scientific networking between Ohio State and eastern Africa partners; (b) enhance interactions among producers, scientists and policymakers; and (c) improve the livelihood of poor urban and peri-urban livestock producers in minimizing zoonosis.

### **2. The End and the Beginning of Everything**

*Shane Mecklenburger (Art)*

The End and the Beginning of Everything is a collaborative art-science initiative between the Ohio State Departments of Art and Astronomy, the University of Chicago Department of Astrophysics, Chicago’s Adler Planetarium and the Advanced Computing Center for the Arts and Design (ACCAD). Accelerating technologies are amplifying astronomers’ ability to model and observe, expanding our understanding of life and the universe. This initiative guides young artists in creatively interpreting astronomical research for a public contemporary art exhibition.

### **3. Big Data and the Social Future**

*Peter Shane (Law)*

A multidisciplinary conference on the potential for new enterprises grounded on big data to improve economic, social and political life. The program would publicize the potential of big data enterprises in Columbus, and raise awareness of key law and policy issues. Potential topics include big data as an economic driver, challenges to privacy and information security, big data infrastructure requirements and big data as it relates to government accountability, health care and the urban future.

### **4. Understanding Asia through Religion and Art: Creating Finding Aids and Search Tools for a Database of Original Source Materials**

*Patricia Sieber (East Asian Languages and Literatures)*

Understanding Asia, particularly through its religions and belief systems, is an imperative in today’s global environment. This project will create “finding aids” for the online database of approximately 262,000 photographs in Ohio State’s Huntington Photographic Archive of Buddhist and Asian art. Currently aimed at scholars with advanced knowledge, the archive can vastly extend its reach to multidisciplinary and multi-level audiences through enhanced search capabilities, fostering education about Asia, and creating a template for other databases.

## **2012**

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### **1. Communicating Health Sciences: Emerging Challenges and Opportunities for Public Engagement**

*John Barnard (Pediatrics)*

The promise of modern health science will be realized only if it is understood and adopted by an appropriately informed public. The media is a key factor in creating understanding. We propose two public colloquia, one on personal genomics and the other, nanomedicine, involving health care scientists, science communication experts and journalists. The result will be a unique discourse leading to greater understanding and better communication strategies in these two important emerging areas of health care.

## **2. SistaAction: Black Girls Creating Digital Futures**

*Elaine Richardson (Teaching and Learning)*

The SistaAction project proposes to enhance the critical media literacy skills of urban Black middle school girls in an afterschool mentoring setting, by providing them with access to digital and internet technology tools and assistance in the creation of self-authored counter narrative media productions that support wider representation of empowering images of young women. While work is local, this work addresses a national and global problem through which girls of color experience socialization into oppressive race and gender roles through mainstream mass mediated popular culture.

## **3. Re-visioning Light in Our Lives: A Holistic and Sustainable Approach**

*Mary Tarantino (Theatre)*

The study of light is often compartmentalized, isolated into physics, installation art, theatrical/entertainment, engineering and sustainability. Re-visioning Light in Our Lives brings together individuals from architecture, engineering, theatre, ACCAD, and outside project partners and consultants to examine lighting as it informs human needs, energy efficiency and structures. Student teams will engage the community in outreach research inquiries and construct site-specific installations, testing contemporary lighting applications with an emphasis on lighting function and quality.

## **4. Seeds of Learning: Creating a Language Sciences Pod at COSI**

*Laura Wagner (Psychology)*

This project will create a research “pod” at the Columbus Center for Science and Industry (COSI) dedicated to the study of language. Ohio State faculty will conduct state of the art research studies inside the pod using museum visitors as research participants. Trained Ohio State students will provide educational explanations to adult and child visitors, promoting understanding of language sciences and the scientific process more generally.

# **2011**

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## **1. E3 Lab: Sustainable Development Solutions for Energy, Economy and Equity in Africa**

*Charisma Acey (Architecture)*

The proposal establishes E3 Lab, a local energy solutions incubator for household alternative energy technologies in sub-Saharan Africa. The Ghana Sustainable Change program would examine biodigesters, a low-cost method of renewable energy production from the anaerobic digestion of organic waste. Using geographic information systems (GIS) students and community leaders would prioritize locations for siting biodigesters, as well as tracking adoption and diffusion. The E3 internet portal will enable ongoing communications between community members and study abroad participants.

## **2. Dance Fort: An Interactive Archive of Choreographic Process**

*Bebe Miller (Dance)*

For decades, the traditional method of an artist’s choreographic legacy has been in the documentation of the finished work: videotapes of performance, photographs, etc. With Dance Fort, we seek to create opportunities for artists and scholars to inscribe history in a living way and, using existing and emerging technologies, create archives that are dynamic and equally useful to the current and next generation, shifting the paradigm of an artist’s archive from artifact to artwork.

## **3. Exploration of the Geometry and Cosmology of the Newark Octagon Earthworks**

*Alan Price (Design, Advanced Computing Center for the Arts and Design)*

This project is for the design of an interactive computer application for analysis and understanding of the geometric relationships of Ohio’s Newark Octagon Earthworks to observations of the Moon and Sun. The simulation model will be used for research and to educate the public about these ancient sites in Ohio, and how scientific thinking and observation played an important role in the culture of ancestral Native America.

## **4. Reaching for the Moon: Technology for At-Risk Preschool Children**

*Kathy Cabe Trundle (Teaching and Learning)*

This project assesses the efficacy of using software to develop young children’s computer skills and understanding of targeted science and mathematics concepts. Preschool teachers will be provided with professional development opportunities to develop their understandings of concepts and technology skills. The outcomes are increased teacher preparation and school and technology readiness for young children. This readiness is especially important for at-risk learners; without it they fall behind upon kindergarten entry, especially in STEM pathways.

## **2010**

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### **1. Service Learning and Technology Transfer in Veterinary Public Health and Biotechnology: OSU-VPH-Biotech Eastern Africa**

*Wondwossen Gebreyes (Veterinary Preventive Medicine)*

More than two-thirds of emerging infectious diseases are zoonotic. Ohio State initiated a consortium in Eastern Africa where zoonotic diseases cause significant burden but technological capacity is lacking. While Ohio State has successful programs in infectious diseases, students are lacking global perspectives and first-hand exposure. Using the “One Health, One Medicine” approach, we propose to conduct service learning activities to enhance Ohio State students’ practical knowledge while contributing to control of zoonotic diseases and build biotechnology capacity.

### **2. Development of Globally Competent and Socially Engaged Engineers: International Collaborative Design Project for Aerial Detection of Landmines**

*James Gregory (Mechanical and Aerospace Engineering)*

The proposed project is a student-designed and constructed remote-control air vehicle for rapid, aerial detection of landmines. This project will develop technology that directly benefits society, and serve as a context for the development of future leaders in engineering who possess an integrated worldview of technical excellence, service and global citizenship. A broad impact will result from citizens and students of eastern and western societies discussing the interface between technology and society via videoconference.

### **3. Shifting Centers: Creative Collaboration in and outside of Africa through Cyberlearning and Ubiquitous Technologies**

*Esther Marian Baker-Tarpaga (Dance)*

African and American contemporary choreographers use cyber technology and web-based communities as a space for artistic exchange and innovation. This proposal seeks funding for the development of an online performance symposium. Funds will be used to support research meetings with key collaborators, internationally recognized, award winning artists in Senegal, South Africa, Morocco and Kenya. The symposium content will be determined by the research and creative work of the artists and students collaborating and contributing to the project.

### **4. Reading the Code: Genetic Literacy Across the Middle School Curriculum**

*Richard Voithofer (Educational Policy and Leadership)*

This project addresses the emerging need for genetic literacy. Through the creation of a problem-based learning computer simulation, this project will provide a learning technology for middle school students that crosses mathematics, science and social studies. The ultimate outcome of this project is to help the leaders, STEM workers and citizens of tomorrow to begin to understand the positive and negative impact of the growing body of genetic knowledge and increasing capacity for genetic manipulation.

## **2009**

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### **1. Influence of Culture, Society and Religion on the Practice of Veterinary Medicine in Thailand: The Anatomy, Habitat, Health and Behavior of Asian Elephants**

*Nongnuch Inpanbutr (Veterinary Biosciences)*

The proposed project is to develop an audiovisual program revealing how culture, social and religion influence the practice of veterinary medicine in other countries such as Thailand. This educational program also includes anatomy, habitat, health and behavior of Asian elephants. This program will increase cultural sensitivity and enhance awareness of cultural diversity for students and elevate the quality of education on Asian elephants. This will promote International Studies at Ohio State, nationally, and globally.

### **2. Enhancing Interest in Science and Technology by Engaging High School and Undergraduate Students in Real-Time Research Projects**

*Parwinder Grewal (Entomology)*

Ensuring the vitality of the nation’s scientific and technological enterprise requires that we tap the talents of all citizens. The goal of this summer program is to enhance student interest in science, technology, engineering and mathematics (STEM disciplines) by immersing them in ongoing, OARDC research projects. By opening the doors to underrepresented high school and undergraduate students from rural areas, the program will influence future leaders and effectively engage Ohio State in the community.

### **3. The Virtual Pasture**

*Michael Mercil (Art)*

The Virtual Pasture is a project for the Department of Art with the College of Food, Agricultural, and Environmental Sciences and the Wexner Center for the Arts. Beginning in spring 2009, The Virtual Pasture reanimates the central campus landscape with a small flock of sheep grazing off-site, but streaming through images transmitted live to a video monitor installed outside the Wexner Center to face the Oval. The project includes working with Ohio State Extension's 4-H Youth Program to produce a documentary video. Through these and related activities, The Virtual Pasture creates a visible public forum for a variety of issues regarding the local production, marketing and distribution of food in an increasingly industrialized, mechanized and technology-centered agricultural economy.

### **4. Every Reader, Every Writer Has a Story**

*Cynthia Selfe (Center for the Study and Teaching of Writing)*

"Every Reader, Every Writer Has a Story" focuses on the importance of preserving literacy stories, especially for groups whose literacy history has been ignored. These presentations and workshops acquaint audiences with the Digital Archives of Literacy Narratives (DALN), the first public, online repository to preserve personal accounts of how individual citizens, families, and communities learn to read and write, and how literacy shapes their lives. The DALN supports historical, educational and community research on literacy.

### **5. Antibiotic Resistance Transmission through the Global Food Chain: Public Health Impact and Intervention Strategies**

*Hua Wang (Food Science and Technology; Microbiology)*

The rapid emergence of antibiotic resistant (ART) bacteria is becoming a major public health threat. Our studies found that ART non-pathogenic and "beneficial" bacteria were highly prevalent in conventional food products, and the food chain has become a significant community-based avenue transmitting ART to humans. We seek Battelle support for education/extension activities (international conference, food safety video, publications) to reveal and control the global health impact of ART bacteria.