Welcome!

YouthAstroNet

Click on “Join Audio By Computer”

If your computer does NOT have a microphone or you aren’t hearing the audio, you can use a phone to dial in: (415) 762-9988 or (646) 568-7788; Meeting ID: 357 839 859  Participant ID: (you should see this 2 digit ID on your Zoom screen; if you can’t find it, just press # when asked for it)
Mary Dussault  
Science Education Program Manager  
YouthAstroNet Principal Investigator

Erika Wright  
Education Specialist  
YouthAstroNet Community Coordinator

Frank Sienkiewicz  
Telescope Engineer

Aladdin Ibrahim  
IT Specialist

Harry Houghton  
Education Specialist
Research Team:
Philip Sadler
Gerhard Sonnert
Annette Trenga

STEM Mentors:
2 dozen scientists, engineers, computer specialists, grad students, undergraduates, science communicators
Webinar Overview

- General Background Information
- Introduction to YouthAstroNet Research
- Introduction to YouthAstroNet Program
- Training
Robotic Telescopes

Ben and Cecilia are two of five MicroObservatory telescopes, controllable over the internet.
Expanding upon what we’ve learned
Innovative Technology Experiences for Students and Teachers (ITEST) program

Helping prepare a diverse, skilled, and innovative STEM workforce
Intended Outcomes

For Youth Participants:
- Increased competency with 21st C. skills (problem solving, teamwork, digital media literacies)
- Increased interest, awareness, knowledge, and understanding of STE(A)M content
- Increased proficiency with skills of scientific practice
- Increased understanding of technology as a tool for doing science

Youth develop capacities to productively engage in STEM learning activities

Desired Long-Term Impact:
- Youth participants develop interest and disposition for IT/STEM careers
- Youth participants develop an identity as someone who knows about, uses, and can contribute to science learning.
NSF Funded Research Project
Facilitating Parental Consent

- As an educator participant, we require that you be willing to participate in the research study that is associated with the YouthAstroNet program, and be willing to facilitate the parental consenting process for student participation in the study.
- We will provide you with consent/permission forms to distribute and collect back from parents.
- We also ask that you reserve time in your program to facilitate your students in taking our surveys both PRE and POST participation.
5. How much do you disagree or agree with these statements?

<table>
<thead>
<tr>
<th></th>
<th>No, not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Yes, very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I know about many different kinds of science-related jobs</td>
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<td>b. I am interested in astronomy</td>
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<td>c. I understand the science I have studied in school</td>
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<td>d. I like challenging projects that I have to work hard to complete</td>
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<td>e. I feel confident in my ability to learn math</td>
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<td>f. I know about many different kinds of computer-related jobs</td>
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<tr>
<td>g. When I have to work hard at something, it makes me feel like I'm not very smart.</td>
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<td>h. I am aware of the skills an engineer uses</td>
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</tbody>
</table>

6. How much do the following people see you as a science person?

<table>
<thead>
<tr>
<th></th>
<th>No, not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Yes, very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yourself</td>
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<td>Parents/Family</td>
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<tr>
<td>Friends</td>
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<tr>
<td>Teachers</td>
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</tbody>
</table>

11. How much do you disagree or agree with the following statements?

<table>
<thead>
<tr>
<th></th>
<th>No, not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Yes, very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoyed participating in YouthAstroNet activities</td>
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<tr>
<td>I learned a lot from YouthAstroNet</td>
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<tr>
<td>I intend to keep using my YouthAstroNet account</td>
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</tbody>
</table>

12. In this YouthAstroNet program or Astronomy unit, how often did you...

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once or twice</th>
<th>Several times</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request images from a robotic telescope</td>
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<tr>
<td>Use a computer to enhance or catalog telescope images of objects in space</td>
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<tr>
<td>Use a computer to measure the size, diameter, or brightness of parts of an image</td>
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<tr>
<td>Post or print your own images for others to see</td>
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</table>

13. How often did the following activities occur during your astronomy/YouthAstroNet classes?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
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<th>Several times</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests or quizzes were given by the teacher (not including this survey)</td>
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<td>Students taught each other</td>
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<tr>
<td>You watched science videos</td>
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<tr>
<td>You went on a field trip</td>
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<tr>
<td>Guest speakers visited your class</td>
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</tbody>
</table>
Pre- and Post-Test Administration

20 Programs
30 Groups
261 subjects with Pre/Post
- 57% Female
- 63% White
- 21% Black or African American
- 13% Asian
- 10% American Indian or Alaskan Native
- 3% Native Hawaiian or other Pacific Islander
Change in Standardized Measures from Pre- to Post-test

Effect Size (Change in units of SD from Pre-Test to Post-Test)

- Affinity (Common Instrument+)
- STEM Identity
- Computers/Eng/Math
- STEM Career Interest
- Astronomy Knowledge

+2SD
-2SD
- Error bars=±2SE
Essential Program Elements

• Youth learn to control robotic telescopes, analyze images of astronomical objects using tools and techniques of professional astronomers, and interpret these images.

• Youth work is aimed at an authentic capstone project—the creation of one or more polished final product(s) of personal interest, that use MicroObservatory images to visually communicate an idea or story about the universe to a wider audience.

• STEAM/Arts integration accomplished via image processing, the relationship between astrophotography and digital photography, engineering/design challenges, learning about light and color, and the multidisciplinary skills and knowledge applied in the design and production of a final product.
Capstone Projects
Additional Elements
As part of YouthAstroNet

- Broadened STE(A)M learning focus.
- Personalized Online workspace.
- Online resources and activities for self-paced learning.
- Access to YouthAstroNet online mentors.
- Behind the Scenes Virtual Tours.
- Contests, capstone activities, events, and completion certificates.
- Opportunities for parental participation.
- Participation as subjects of a research study.
For Youth and Educators: YouthAstroNet Activity Portal

Just for Educators: YouthAstroNet Educator Portal
Digital Image Processing and Analysis
Webinars may involve CFA staff including scientists, researchers, Graduate students, and other STEM professionals.

Opportunities will include virtual tours, meet and greets with scientists, and more!
Online Training Overview

- **Online Workshop**
  - 6-8 hours of self-paced training to include:
    - Watch 3 webinars (live or recorded)
    - Introduce yourself to the community
    - Take images with robotic telescope
    - Edit images with online image editing tool
    - Post on forums, complete training checklist
Workshop Goals and Desired Outcomes

- Build a repertoire of skills and teaching strategies for implementing YouthAstroNet programs and activities with youth
  - Increase content knowledge related to astronomy, telescopes, image processing
  - Gain skills in using MicroObservatory Robotic Telescope system
  - Practice image processing skills
  - Gain confidence in using YouthAstroNet online platform
  - Examine a variety of possible lesson sequences

- Develop a sense of belonging to the YouthAstroNet learning community!

- By the end of this workshop, you will create your own wiki page of how you plan to implement YouthAstroNet for YOUR students!
Immediate Next Steps:
Confirm your participation with YouthAstroNet

- Reply to Consent-Request Email from Annette Trenga, atrenga@cfa.harvard.edu

- **Complete Educator Pre-Survey** BEFORE watching 1st Webinar
  - link to survey will be emailed to you (https://www.surveymonkey.com/r/YANEDPRE17)
Thank You!!

-The YouthAstroNet Team