Motivation

- NSF, Council for American Competitiveness, National Academies: need for a large increase in STEM workforce
- Media coverage of science is spotty and scientists are often caricatured in the media
- Stereotypes regarding scientists are barriers to engagement of elementary and middle-school students

Slide modified from Dr. Sarbajit Banerjee
Inspiration

APS Comic Book Series aimed at high-school kids

“Spectra” is a superhero endowed with “laser powers”

Manual with exercises and activities.
How it all started: the Cottrell Comic Challenge Project

Snezana Stanimirovic (PI): University of Wisconsin
Yadong Yin: University of California Riverside
Michael Gladders: University of Chicago
Karen Bjorkman: University of Toledo
Bo Hammer: American Physical Society
Sarbajit Banerjee: University at Buffalo, SUNY

Objectives:
- Demystify the life of scientists
- Emphasize creativity and “coolness factor” of science
- Underline how scientific advances are transforming daily lives
- Improve societal literacy of STEM disciplines.
- Share the excitement and importance of STEM discoveries with young generations.
Galaxy scouts focus: why this age group?

• Studies have shown that *middle school* is a critical time to encourage students’ interest in STEM disciplines (Bybee & McCrae 2011). This is the time when many young people are identifying their core interests and abilities.

• Girls in middle school show a declined interest in mathematics and STEM areas.

• Studies have shown that introducing scientific concepts in an interesting way is essential to spark students’ interest in science, and to promote long-term scientific literacy.

• **Focus:** 4th to 8th grade reading level (age 9-13) + comic strip

  https://www.astro.wisc.edu/outreach/astro-comic/

[QR Code]
• **Snezana Stanimirovic**: Professor, UW-Madison Astronomy Department,
• **Dr. Amy Gaeta**: UW-Madison
• **Kay Kriewald**: Senior Outreach Specialist, UW Space Place
• **Robert Tetzner**: Senior ELSI educator, artist, owner of T&C Language Center, Taipei (Taiwan)
• **Jan Lin**: illustrator, artist, UW-Madison
• **Dr. Rebecca Cors**: Evaluator and Scientist, Science and Nature Learning, UW-Madison
Have been used for various outreach projects

Science Expeditions at UW 2022

Grandparents University at UW 2023

T&C Language Center, Taipei
Galaxy Scouts Evaluation Year 1 Report
Wisconsin Center for Education Research
October 13, 2023 presentation to the UW-Madison Astronomy Department
**EVALUATION PLAN**

**Y1: EXPLORE**
- Get feedback on Comic Book #1 from
- Pilot test some evaluation tools (e.g., surveys, interviews).

**Y2: DEVELOP**
- Test activities for making Activity Book #1.
- Complete comic book #2.

**Y3: Run ambassador program?**
- Get feedback about Activity Book from youth, educators.
- Measure youth outcomes from Ambassador program.
- Explore how to sustain Galaxy Scouts.
# Evaluation Activities and Products

<table>
<thead>
<tr>
<th>Activity</th>
<th>Purpose</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fact Sheet</td>
<td>▪ Communicate with participants about the program goals</td>
<td>na</td>
</tr>
<tr>
<td></td>
<td>▪ Inform about purpose and process of evaluation.</td>
<td></td>
</tr>
<tr>
<td>Youth Survey</td>
<td>▪ Elicit feedback from youth about comprehension and engagement.</td>
<td>41 youth</td>
</tr>
<tr>
<td>Educator Interviews</td>
<td>▪ Better understand how to engage youth through comic books.</td>
<td>2 groups</td>
</tr>
<tr>
<td></td>
<td>▪ Elicit ideas for effectively designing activity books.</td>
<td>5 educators each</td>
</tr>
<tr>
<td>Test activities</td>
<td>▪ Garner feedback from youth on activities under development.</td>
<td>202 youth in 7 groups</td>
</tr>
</tbody>
</table>

**Products of evaluation:**
- Suggestions useful: improve age-look of characters; improve, simplify story line of Comic Book #2.
- [Proof of comic book concept](#) as an engaging tool to inspire youth about STEM.
- Evaluation rubric educators’ feedback on first Activity Book #1 based on the [Activation Lab](#)