



# SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

## Future Faces of Physics Award Proposal

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Project Proposal Title	G5: Girls are the 5 <sup>th</sup> FUNdamental Force
Name of School	Coe College
SPS Chapter Number	1255
Total Amount Requested	\$500

### Abstract

The Coe College chapter of SPS recently developed a youth mentorship program for middle school girls to promote and sustain interest STEM fields. At local institutions we will offer demonstrations, tutor, and pair girls with collegiate mentors for support. Our goal is to encourage girls' education and pursuit of STEM careers.

# Proposal Statement

## Overview of Proposed Project/Activity/Event

We intend to implement a mentorship program for girls enrolled within three middle schools in Cedar Rapids. As an SPS chapter, we will match an estimated 50 participants with female SPS members to connect girls with motivational mentors. We will meet with them twice a month to supplement their academic curriculum with project demonstrations and clarify homework concepts before assessments. In order to match students with SPS members, participants will complete an application committing to attend at least one session a month in addition to sharing their personal goals, hobbies, and educational interests. We will be a resource for these girls as they progress throughout middle school, maintaining contact during high school, and guiding them towards higher education in STEM related fields.

## How Proposed Activity Promotes Physics Across Cultures

Members of Coe College's SPS chapter have opportunities to participate in conferences such as the Quadrennial Physics Congress, and APS Zone 11 Meeting; however, the underrepresentation of women is distinctly noted. Conversations regarding the concern for the lack of women in applied and mathematical sciences agree that we must be proactive in engaging the next generation of scientists. Our mission is to sustain local girls' interest in science classes by tutoring them individually and in group settings based on their deficient areas. We are also matching girls with mentors based on common interests and future aspirations. We understand that pressure from peers to fit into a certain image is one of the primary factors of leaving STEM studies at an early age. Girls feel uncomfortable being singled out in front of their class, even if the teacher is praising their work. We want to build participants' confidence and offer them a network of successful women with a shared passion. Therefore, we will support, encourage, and inspire these young women by showing them the possibilities of a future in physics.

## Plan for Carrying Out Proposed Project/Activity/Event

- Personal
  - Anne Ruckman- Co-Project Manager: Organize mentoring sessions, oversee tutoring sessions, ensure outreach goals
  - Brigitte Smith- Co-Project Manager: Organize mentoring sessions, oversee tutoring sessions, ensure outreach goals
  - Collin Wilkinson- Coe College SPS Chapter President: Responsible for checking that our biweekly youth engagement sessions are consistent with our schedule
  - Tori Eng- Women in STEM President, SPS Associate Zone 11 Counselor: Gathering mentors and tutors at Coe College
  - MaryJane Been- Women in STEM Vice-President: Confirming that the content of our tutoring sessions is relevant to participant's coursework and preparing demonstrations

- Megan Morris- Women in STEM Treasurer- Overseeing budget expenditures including: basic school supplies for participants, tutor wages, and transportation costs
- Ella White- Secretary: Pairing mentors and mentees for successful connections, social media responsibilities, documenting participation of mentors and mentees
- Dr. Firdevs Duru- Coe College Women in STEM Advisor: Coordinating mentoring meetings, overseeing project
- Dr. Steven Feller- Overseeing SPS community engagement with this project
- Dr. Ugur Akgun- SPS Chapter Advisor: Overseeing SPS chapter meeting plans with mentees
- Marketing
  - This project will be marketed through the Grant Wood Area Education Association newsletter, flyers will be posted in selected schools, letters to parents will be distributed, and social media platforms through our SPS chapter.
- SPS member participation
  - There will be at least 20 Coe College SPS members engaged in this partnership. Other groups involved will be collegiate organizations including: Physics Club & Women in STEM
- Expertise
  - The project will be led by Anne Ruckman and Brigette Smith who are both optimistic, innovative, and passionate young women. Anne Ruckman has held previous officer positions through Coe College's Student Activities Committee and is currently one of the Women in STEM Outreach Coordinators in conjunction with Brigette Smith. Ruckman and Smith are very active in our SPS chapter and Physics Club through community events such as Coe College's Playground of Science and the Open Minds Open Doors (youth conference for women).
  - Collin Wilkinson leads the SPS Minute of Science weekly meetings. His experience discussing physics phenomena and relating it to current events will provide mentors and mentees another perspective and greater understanding to the application of subjects in science classes.
  - Dr. Feller, Dr. Akgun, and Dr. Duru plan campus and community engagement events regularly including our SPS chapter meetings, SPS galas, and networking activities.

### Project/Activity/Event Timeline

Dates	Objectives	Officers Involved
January 8-January 19, 2017	Contact middle schools and confirm group tutoring hours and locations Issue application forms	Anne Ruckman, Brigette Smith
January 19, 2017	Participant and mentor applications due	Tori Eng, Ella White
January 20-February 2, 2017	Purchase supplies	Megan Morris
February 2, 2017	Mentor/Mentee pairs finalized and notified	Ella White
February 2, 2017	Confirm current subject topics in selected courses and prepare demonstration	MaryJane Been
February 1-16, 2017	1 <sup>st</sup> Mentor/Mentee Session	All Officers
February 17-28, 2017	2 <sup>nd</sup> Mentor/Mentee Session	All Officers

February 28, 2017	Confirm current subject topics in selected courses and prepare demonstration	MaryJane Been
March 1-19, 2017	3 <sup>rd</sup> Mentor/Mentee Session	All Officers
March 19-23, 2017	Issue checkpoint evaluation survey	Ella White, Collin Wilkinson, Anne Ruckman, Brigette Smith
March 23-31, 2017	4 <sup>th</sup> Mentor/Mentee Session	All Officers
March 20, 2017	Confirm current subject topics in selected courses and prepare demonstration	MaryJane Been
April 1-13, 2017	5 <sup>th</sup> Mentor/Mentee Session	All Officers
April 13-20, 2017	Issue final evaluation survey	Anne Ruckman, Brigette Smith, Ella White
April 20, 2017	SPS final project meeting	All Officers
April 20-May 31, 2017	Submit final report	Anne Ruckman, Brigette Smith

## Activity Evaluation Plan

In order to evaluate the success of this project, we will be comparing the information provided on the student's application to the checkpoint evaluation survey and final evaluation survey. The application will ask them to express one reason why they want to participate and indicate three learning objectives. During the survey components, we anticipate asking them to rate their overall experience, compare their interest in STEM classes before the program, and list their learning outcomes. We will not ask participants if their academic grades improve, but we will inquire about their confidence and involvement in the classroom at the conclusion of this program. A student must feel respected and appreciated as these traits will prevent imposter syndrome which often deters women from STEM fields.

We will also assess the amount of participants and consistency in attendance. As an SPS chapter, we will discuss the level of attention and enthusiasm shown by students during tutoring sessions and prepared demonstrations. All volunteers will have the opportunity to communicate their experience at the final SPS project meeting.

## Budget Justification

We will need to purchase school supplies for low-income students, order demonstration equipment, cover transportation expenses for volunteers, and provide t-shirts to participants and volunteers. Coe College Student Senate has allocated \$300 to aid our mission which is designated for academic materials. Students may not have resources accessible to them such as notebooks and writing utensils. We plan to issue necessary supplies to these students in our program so that they can complete homework and improve note-taking skills. The demonstration equipment will engage visual and hand-on learners to maintain interest outside of standard school hours. Additionally, it will expose them to experiments that they would not have the opportunity to experience otherwise. The transportation expense for volunteers will cover the cost of gas at the transportation reimbursement rate of Coe College. Volunteers are dedicating their time rather than earning wages at a job and may not have the means to pay for transportation. We do not want to limit the number of volunteers so we plan to reimburse the travel expense. The t-shirts will provide an extra incentive for participants and help students connect to their mentors. We plan to tie-dye shirts together at the first mentor/mentee meeting to engage

students with their mentor in a relaxed environment. We believe that mentors and mentees wearing the same t-shirt will empower girls by showing them that they can succeed like their mentor and see themselves as future physicists. It will also be a memento for them as they progress through STEM and encounter different types of bias.