Proposal Review 3 : 1829794

Agency Name:	National Science Foundation
Agency Tracking Number:	**1829794**
Organization:	
NSF Program:	CyberTraining - Training-based Workforce Development for Advanced Cyberinfrastructure
PI/PD:	Hickernell, Fred
Application Title:	CyberTraining: CIC: Cross-Disciplinary Education for Next-Generation Computational Scientists
Rating:	Very Good

Review

Summary

In the context of the five review elements, please
evaluate the strengths and weaknesses of the proposal with respect to intellectual merit.

Strengths:

+ The proposed activity can significantly advance knowledge and understanding in computational science for educating both CI contributors and CI users.

+ The project provides a summer computational science course for high school students and college students, requiring minimal computational background.

+ The project strengthens existing undergraduate and graduate level computational science courses by adding the most up-to-date technologies and industry-proposed projects.

+ The project introduces research experiences in computational science for community college students.

+ The project provides summer fellowships for undergraduate and graduate students who can join large-scale computation projects in national labs or work on computational science rese groups outside their major.

+ The team is well qualified to conduct the proposed work, with experts from multiple disciplines including computer science, mathematical science, and nature science.

+ The project will share the insight gained in articles, talks, and posts on our website. The project will also make available the course materials, software packages, and code templates developed.

Weaknesses:

- The proposal tasks about summer school, course enhancement, summer research experience, and summer fellowship, are general, but not very unique for using advanced CI resources and services.

In the context of the five review elements, please
evaluate the strengths and weaknesses of the proposal with respect to broader impacts.

Strengths:

+ This project will educate cross-disciplinary computational scientists, and extend beyond Illinois Tech students to high school and community college students, many of whom are underrepresented minorities.

+ This project fosters the integration of research and education in multiple disciplines including computer science, mathematical science, and natural science.

+ The project will provide education and training for high school through Ph.D. students.

+ A couple of improved courses related to computational science will provide training opportunities for a large number of students from the university.

+ The results generated by this project will be disseminated broadly to enhance scientific and technological understanding.

Please evaluate the strengths and
weaknesses of the proposal with respect to any additional solicitation-specific review criteria, if
applicable

Strengths:

+ The proposal addresses two major challenges, academic silos and ignorance of good practice for large-scale computation, in training, education, and workforce development of computa scientists.

+ This project integrates computational science into a summer course and undergraduate and graduate level courses.

+ This project provides a summer program for high school students and a research internship program for community college students, especially those who are underrepresented minorit

+ The project will establish an external advisory board and be partnering with a couple of educational organizations for collective impact.

+ The project provides clear and measurable criteria for evaluation, and also provides sound recruitment plans of different activities.

+ The project management and collaboration plans are also reasonable and clear.

+ The project is very relevant to OAC and MPS

Weaknesses:

- The proposal lacks unique modes of discovery and use of advanced CI resources, tools, and services in the proposed cyber training.

- It is not very clear if the proposed activities are scalable to a large number of users, and the major tasks in this project could be sustained beyond NSF funding.

Summary Statement

The proposal proposes to establish a cross-disciplinary education program for next-generation computational scientists. The proposal is well-written, the team is qualified to do the work, a work plan is realistically laid out. There is potentially high impact on enabling cyber training for computational scientists from this work.