Proposal Review 4 : 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:	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.

This proposal describes a substantial upgrade to the computational science program at IIT. They will work with high school and community college and university undergraduates. In additi
the upgrade to the curriculum they will introduce a summer computational science course. The focus in on traditional HPC. They have a good emphasis on interdisciplinary science and a
"center" CISC at the university that is led by the PIs who are from math, computer science, biology, chemistry and physics. They also have a history of strong collaboration with Argonne N
Lab.

Intellectual Merit:
Not all of the required elements are in the proposal.
Strengths: the challenge û They correct describe several challenges: Academic Silos and lack of knowledge about good practices.
New modes of discovery and use of advanced CI resources, tools, and services in fundamental research enabled- not explicitly discussed but we infer that the upgrade to the curriculum t
contemporary HPC skills will enable new discoveries. It is notable that they will introduce new courses in computational quantum chemistry, computational biochemistry and drug design, a
cheminformatics.
Advances in integrating skills- Because their program is mathematics and not computer science their students lacked conventional systems skills. Consequently, they have introduced a co
on professional practices. The CS course on advanced scientific computation has enabled a number of students to receive summer internships at Argonne National Lab.

Weaknesses:
This plan is adequate and a significant upgrade to their program. However, it is rather conventional. There is little here that address advances in the field past year 2000. While there is me
of GPUs there is nothing innovative there. There is no mention of FPGAs or cloud computing or data analytics beyond the traditional methods.

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

Strengths
Steps to broaden access- The most interesting parts of this proposal is the outreach to high school students and community colleges. They are partnered with the College of DuPage to re
students into their summer programs and encourage them to transfer to IIT.
Stakeholders engaged, and partnerships forged- The partnership with DuPage is important as is the connection to Argonne and Fermilab and the contacts (Carter, Curfman McInnes and
Holzman) form the external advisory committee.
Plans for recruitment and assessment- The recruitment plan is good and it involves high school and community college students. The assessment plan is adequate.

Weaknesses:

Scalability to a large number of people directly and indirectly, and sustainability of key aspects beyond NSF funding- This is a topic that is a slight weakness. Clearly the upgrade of the cur is important, but I cannot see this program providing innovation that will be picked up by others.

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

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Plans for management and collaboration- The collaboration among the PIs looks excellent and the management plan is spelled out in in an appendix.
The Data Management Plan- is standard and adequate.

Summary Statement

This is a reasonable plan to upgrade the curriculum to support the HPC skill set of their students, high school students and potential transfers from the local community college. there is an excellent engagement with computational biology.

Unfortunately, i feel the students will need more than these skills. CI require a more diverse set of modern skill around big data analytics including machine learning and cloud and edge computing.