Project Summary

Overview

TN Tech has nearly doubled its amount of externally-funded research from $11 M in 2015 to $20 M in 2020, and plans to reach $40 M of externally-funded research by 2025.

Intellectual Merit

The acquisition of Warp 1 will enable research projects aligned with four of NSF's 10 Big Ideas.

Broader Impacts

TN Tech has a strong history using HPC in workforce development at all levels.

Project Description

A: Information about the Proposal

Instrument Location: Tennessee Tech University, Clement Hall Room NNN
Instrument Type: HPC cluster with high-speed networking and data storage for active jobs

B: Research Activities to be Enabled

This cluster will provide an easily-accessible computing facility that immediately benefits TN Tech's research efforts across several departments and research centers to advance both fundamental and applied research in science and engineering.

B.1: Intellectual Merit

The proposed Warp 1 cluster will enable research projects aligned with four of NSF's 10 Big Ideas.

B.2: Users and Representative Scientific Research

This section details a selection of research projects.

Next-Generation Genomics: Faculty 1, Department 1; Faculty 2, Department 2; Faculty 3, Department 3 (Other University) (5 faculty, 1 postdoc, 7 graduate students, 2 undergraduate students) Funded projects in our labs use HPC resources to (1) generate genome-wide DNA data to inform on the management of endangered species [**torkamaneh2016**], (2) survey community composition based on DNA extracted from environmental sources [**watts2019**], and (3) investigate evolutionary processes in model organisms [**hurt2021**].

Broader Impacts

Here we have a statement of broader impacts, which is often required as its own heading.

B.3: Results from Prior NSF Support

Award N ($123,456, 2/2019–1/2022) "REU: Title" (Lastname, Senior Personnel)

Intellectual Merit Dr. Lastname is part of an expert group of faculty members who mentor REU participants in certain topics, by helping students to (1) conceive, design, implement, and assess research projects in this area; and (2) learn diverse different toolsets in domains such as example 1, example 2, and example 3.

Broader Impacts Dr. Lastname's portion of the REU provided a research experience to 5 undergraduate students, including 2 female students.

Publications To date, this effort has resulted in 4 published papers [**paudel2019a**, **paudel2019b**, **paudel2018**, **mookiah2017**], with undergraduate and graduate students as first two authors.

Table 1: Selection of externally-supported users impacted by the proposed equipment

Field	User	Applications	Support
Department 1	Faculty 1	Materials science	NSF
	Faculty 2	Molecular dynamics	CWRU, DOD
Department 2	Faculty 3	Fundamental science	NSF