

BUDGET JUSTIFICATION

1. Personnel (\$989,833 total over 4 years)

For all personnel, we assume a 3% annual increase in salaries.

The University of Idaho has determined the salary year for senior personnel to be based on the calendar year.

Senior Personnel: (\$135,850 total over 4 years)

a. PI, Michael Maughan. We request 160 hours of calendar year salary per year for Dr. Maughan, who will oversee the entire project.

b. Co-PI, Cai. We request 80 hours of calendar year salary in all four years for Dr. Cai who will lead durability testing, work collaboratively with other researcher to optimize performance, and mentor/advise graduate students.

c. Co-PI, Manrique. We request 80 hours of calendar year salary in all four years for Dr. Manrique. Dr. Manrique will lead resilience studies, educational outreach, and mentor/advise graduate students.

d. Co-PI, Ibrahim. We request 80 hours of calendar year salary in all four years for Dr. Ibrahim who will support testing of materials and panels, mentor graduate students, mentor a postdoctoral scholar, and mentor early-career faculty.

e. Senior Personnel, Robertson. We request 40 hours of calendar year salary in all four years for Dr. Robertson who will support manufacturing activities, mentor graduate students, and mentor a postdoctoral scholar.

f. Senior Personnel, Fu. We request 40 hours of calendar year salary in all four years for Dr. Fu who will manage material performance and machine learning activities and mentor graduate students.

g. Senior Personnel, McDonald. We request 40 hours of calendar year salary in all four years for Dr. McDonald who will support manufacturing activities, mentor graduate students, and mentor early-career faculty.

h. Senior Personnel, Baker. We request 40 hours of calendar year salary in all four years for Dr. Baker who will support resilience outreach, mentor a graduate student, and mentor early-career faculty.

Other Personnel: (\$706,642 total over 4 years)

a. We request funds for a project coordinator who will be funded to work in this role for 208 hours of calendar year during all four years.

b. We request funds to support a Post-Doctoral Researcher 100% in all four years.

c. Funds are requested to support 5 graduate students for all four years during both the academic year and the summer.

d. Funds are requested to support temporary help undergraduate students for all four years of the project during the academic year.

Fringe Benefits: (\$147,341 total over 4 years)

The University of Idaho Consolidated fringe rates are 30.7% for faculty, 41.8% for staff and 2.1% for students.

2. Travel: (\$80,000 total over 4 years)

Travel for the required NSF all-PI meeting is estimated to cost \$6,000 in year 1 of the project. In subsequent years of the project, only the PI is required to attend with estimated costs of \$2,000 in each of years 2 through 4.

Each year of the project \$12,000 is requested to support conference travel for the PIs and graduate students.

In year 3 of the project all faculty investigators, postdoctoral researchers, and graduate students will travel to Auburn University for an all-team meeting. These travel costs are estimated to be \$20,000.

We request funds to cover PI travel as described in the project description (\$18,000 in year 1, and \$2,000 per year after).

3. Other Direct Costs: (\$2,221,030 total over 4 years)

Publication costs (\$10,000): We request funds to defray publication costs for open-access journals.

Project Evaluation (\$159,000 as a service contract): The evaluation will be conducted by Dr. McInnis and is budgeted as a service agreement with The Implementations Group (TIG).

Materials and Supplies (\$106,000): We request funds to modify existing manufacturing equipment as necessary to conduct the study, purchase necessary raw materials to be combined with resins for evaluation, to produce fixturing necessary to test materials, to purchase testing supplies, and to maintain necessary equipment.

Computer Services (\$6000): We request funds to develop and maintain a website hosted by NKN for the duration of the project.

Outreach Activities (\$2500): We request \$2500 each year for supplies to conduct outreach activities to local educational institutions.

Workshop Supplies (\$3000): In year 1 of the project, the University of Idaho will host an all-team meeting/workshop. \$3000 is requested to cover supplies related to this activity.

Data Portal Access (\$50,000): NSF requires the use of the T-DOP reporting software. The cost of access is \$12,500 each year of the project.

Subaward (\$1,611,375): The University of Idaho will collaborate with Auburn University on the development of bio-based resins for additive manufacturing of biomaterial reinforced composites. Auburn University will evaluate the recyclability of composite materials. Budget and justification provided separately.

Graduate Student Fees and Insurance (\$265,655): Graduate Student tuition and fees at the University of Idaho are currently \$9,876 per year, \$549 per summer credit and health insurance is \$1902 per year. We assume a 5% escalation.

4. Indirect Costs (\$683,446 total over 4 years)

The University of Idaho Indirect Cost rate is 47.5%. Graduate Student Fees and Insurance are not subject to indirect costs. Subcontract costs in excess of \$25,000 are not subject to indirect costs.