

Clarkson 2023 Team Science Projects Planning Grant (TSPPG)

Background: Clarkson's Sponsored Research Services (SRS), in partnership with our internal Research Advisory Committee (RAC), is launching a new effort to support faculty research grounded in Team Science. The funds, provided by the Provost's Office, are an investment in research teams in order to (1) address a major societal challenge, (2) elevate our research reputation in the team's thematic area, and (3) ultimately attract external research funding through a team science approach to research.

Team science and convergence research have emerged to reduce institutional barriers in academia and further the quest for knowledge. As per the National Science Foundation (NSF), ["convergence research is a means for solving vexing research problems, in particular, complex problems focusing on societal needs. It entails integrating knowledge, methods, and expertise from different disciplines and forming novel frameworks to catalyze scientific discovery and innovation."](#)

Convergence research is identified by two primary characteristics:

- *"Research driven by a specific and compelling problem."* Convergence Research is generally inspired by the need to address a specific challenge or opportunity, whether it arises from deep scientific questions or pressing societal needs.
- *Deep integration across disciplines.* As experts from different disciplines pursue common research challenges, their knowledge, theories, methods, data, research communities and languages become increasingly intermingled or integrated. New frameworks, paradigms or even disciplines can form sustained interactions across multiple communities."

For more information on convergence research see:

- <https://drrohitvarma.com/three-defining-characteristics-of-convergent-research/>
- [Wilson, N. \(2019\). On the road to convergence research. *BioScience*, 69\(8\), 587-593.](#)

Team science is defined by the Southern California Clinical and Translational Science Institute (SC CTSI) as "a collaborative effort to address a scientific challenge that leverages the strengths and expertise of professionals trained in different fields." For more information on Team science, see:

- <https://sc-ctsi.org/training-education/what-is-team-science>
- Bennett, L. M., Gadlin, H., & Marchand, C. (2018). *Collaboration Team Science: Field Guide*. US Department of Health & Human Services, National Institutes of Health, National Cancer Institute.
- Cooke, N. J., & Hilton, M. L. (2015). Enhancing the effectiveness of team science.

Clarkson University [research clusters](#) maximize our historic strengths and represent opportunities for national and international recognition. This team science project planning grant (TSPPG) program is a strategic investment in research, with the goal of supporting teams of researchers to develop high-impact innovative research programs to enhance Clarkson's reputation as a leader in solutions-focused research and technology development. Meaningful, prioritized investments such as TSPPG foster collaborations across campus, positively impact research productivity, and spur innovation and entrepreneurship.

The Guiding Principles of this initiative recognize (1) the value of diverse teams and transdisciplinary collaboration to solve complex societal challenges, (2) that increasing research



productivity and impact will require strategic investment to support research teams, and (3) that success will depend on stakeholder engagement and support for research translation. In addition to these Guiding Principles, TSPPG is grounded in valuing mentorship and advancement of pre-tenure faculty (although participation is neither constrained nor limited by career stage).

To rise to the challenge to further team science and transdisciplinary research at Clarkson University, Clarkson's Sponsored Research Services (SRS), in partnership with our internal Research Advisory Committee (RAC), has launched for the second year the Team Science Projects Planning Grant (TSPPG).

Objective: To catalyze the development, submission, and successful receipt of high-impact external research funding, the funds under TSPPG will be exclusively used to support faculty teams to prepare competitive proposals addressing critical research areas under the motto of Technology Serving Humanity.

The goal of TSPPG is to place greater emphasis at Clarkson on high-risk/high-payoff research, stakeholder engagement, and interdisciplinary research toward enhancing our research impact within at least one of Clarkson's research clusters. A key goal is to focus within the cluster area(s) to address a specific societal challenge. Planning grants are a short-term investment in our longer-term goals. Specific aims include:

- Create the foundation for a team science approach to support research
- Create a culture of transdisciplinary collaboration
- Increase research funding, including both small and large grants
- In the longer term, increase Clarkson reputation

Faculty research teams who are awarded TSPPG funding will develop and submit at least one major research and/or educational proposal (with a budget greater than \$700K) to an external agency/organization within 2 years of the initiation of TSPPG funding. In support of advancing a team science approach to research at Clarkson, teams must also:

1. **Develop a team collaboration plan within two months of receiving funding (e.g., <https://sc-ctsi.org/uploads/resources/How-to-Write-a-Collaboration-Plan.pdf>), and**
2. **EITHER**
 - a. **Conduct a quarterly webinar series to educate the broader campus community and stakeholders about the area of research (speakers can include internal direct or indirect partners and/or external guests), OR**
 - b. **Coordinate and conduct a full-day workshop that includes Clarkson researchers, partners, and key stakeholders to foster transdisciplinary collaboration, stimulate interactions, and learn about/explore funding opportunities (the Research Advisory Committee can help guide this effort)**

Amount: TSPPG funding supports one-year planning grant activities for two awards, each up to \$30,000 with tuition waiver (equivalent value ~\$30K) for one graduate student, if applicable.



Eligibility: All full-time Clarkson faculty members, regardless of rank, are eligible to apply and serve as a Principal Investigator (PI) or co-PIs. Each application requires at least three faculty PIs and senior personnel including members from at least two of Clarkson’s Schools/Institutes. Individuals may be listed on more than one proposal, but may only be PI of one proposal. The PIs and co-PIs of awards from prior TSPPGs are eligible to apply again after three years from the TSPPG award. PI and co-PIs of prior TSPPG awards (within three years) may be listed as Senior Personnel on a proposal of a topic area different from the prior TSPPG award. Partners from other universities may be listed as Senior Personnel.

We encourage submissions that engage senior and junior faculty and cross disciplinary boundaries. We are particularly interested in non-traditional, high-risk/high-payoff proposals that may lead to the development of significant research efforts, including intellectual property. In addition, the team must demonstrate engagement with stakeholders to motivate the impact of the research and its relevance to technology serving humanity and the importance of the project for society.

Key Dates:

Call for Proposals	January 24, 2021
Faculty Q&A	February 7, 2023 1-2pm Zoom Link: XX
Submission Deadline	Wed March 22, 2023 at 5pm
Reviewer Feedback	April 8, 2023
Invitation Extended	April 8, 2023
Presentations (invited)	April 20, 2023
Selection Reception	Results April 27, 2023

Application Process: All interested research teams must submit a short research application that follows the Proposal Preparation Guidelines to Jessica Avadikian <javadiki@clarkson.edu> with Clarkson University TSPPG Fund in the subject line. **Applications that do not adhere to the guidelines will be returned without review.** Additionally, as part of the final selection process, the PIs of the most meritorious applications will give a short presentation (‘pitch’) to the external review panel at an open forum. Instructions for presentations will be provided to those invited.

Selection Process and Criteria

Selection Process: A two-stage process will be used, incorporating merit review and an oral presentation from the PIs delivered directly to the external review panel.

- **Stage one:** All proposals, including the team’s qualifications and the research capabilities, significance, and potential impact, will be evaluated by a panel of internal and external reviewers of academic stature for scientific and technical merit. The review panel will evaluate proposals for institutional balance and indicators of potential research

productivity, including PI's publications, training record (graduate students), and external funding relative to academic rank. Based on these considerations, the review panel will recommend a slate of 4 meritorious proposals to advance in the competition.

- **Stage two:** PIs of proposals selected at Stage one will be invited to give a ten-minute 'shark tank' presentation to the external review panel, followed by a brief question and answer period. The review panel will select up to three awards.

Stage one review criteria:

Merit will be determined from considerations of:

- 1) the societal importance and novelty of the proposed team science project's stated goal;
- 2) the feasibility of the proposed approaches to achieve the project's goal and objectives;
- 3) the need for, and application of, a convergent research approach;
- 4) the potential of the project to secure external funding within two years;
- 5) the potential for Clarkson to have a strong impact in the selected focus area;
- 6) engagement and potential engagement with stakeholders; and
- 7) complimentary team expertise and ability to work together to address the proposed project's objectives.

Reviewers will rate their assigned applications (each application according to its own merit) using a scale of 1 to 9, as used by the NIH, for the following two factors.

1. the potential impact of the project—considering factors 1 through 5, the ability to transform the field/discipline or problem space or exert a sustained, powerful influence on the research fields involved, and
2. potential to secure external funding—if the proposed planning project is successfully conducted as described, the likelihood the project would be successful in securing external funding from the sponsors identified.

Programmatic factors that will be considered are: (order presented alphabetically)

- 1) *collaboration history*: balance of new collaborations (those whose members have no track record), existing collaborations with a new project, and existing collaborations with variations on an existing project that has high potential to benefit from team science planning funds;
- 2) *institutional balance*: distribution across schools and colleges or departments; distribution to PI level (assistant, associate, full)
- 3) *productivity*: indicators of potential productivity including PI's publications and external funding (relative to academic rank); and
- 4) *student training*: track record of successfully training graduate students.

The purpose of the review is to recommend a portfolio of meritorious applications with the highest potential to achieve the TSPPG goals.

Stage two review criteria:

Proposals selected to be pitched to the review panel will be evaluated for the transformative potential and impact of the proposed project; and the potential to receive a major grant. The review panel will select up to two awards.

Selection:

Award decision: Presenters will be notified of funding decisions after the oral presentations. The review panel may recommend modifications to the proposed research strategy or team composition.

Negotiation and acceptance. The project team will be provided the opportunity to clarify or otherwise negotiate the proposed modifications. The final research strategy, team, and budget will be incorporated into the award documentation. The PI's will affirm their understanding of the reporting requirements and expected outcomes for the submission of at least one large proposal, and if not funded, a revised submission.

Pre-award Requirements:

- All applicable institutional regulatory requirements must be addressed prior to project initiation, e.g., human or animal subjects' protections, environmental health requirements, etc.
- All team members will be asked to sign an acknowledgement that acceptance of the funds comes with the expectation that within 24 months of project award, a large external funding proposal will be prepared and submitted. If the project is not funded, it is expected that the proposal will be revised and resubmitted.

Reporting Requirements

A final report will be required 12-months after the award start date. Failure to submit the required report by the deadline specified will result in funds being frozen until this requirement is met. Reports must describe project results, and evidence of the pursuit of external funding including declined proposal review results (if available).

Appendix: Clarkson's Research Focus Areas

- 1. Computational and Data-Enabled Discovery (CDED)** Cross-cutting discipline that allows for the analysis and understanding associated with the massively complex multi-modal data sets from modern sensor-rich, computational rich engineering, scientific, and social media settings. Strengths in data analytics and complex systems modeling span the three schools and includes dynamical systems as learned from data, sensors and controls, business intelligence and financial technology, and artificial intelligence.
- 2. Healthy Global Solutions (HGS)** Interdisciplinary faculty teams from across campus create healthy environment solutions that ultimately protect air, water, and habitat resources; reduce public health threats from environmental contamination or lack of access to medical care; develop and implement new energy policies and technologies; create sustainable infrastructure and communities; integrate environmental concerns into management practices; and, ensure the security of our societies.
- 3. Advanced Materials Development (AMD)** Advanced materials experts work collaboratively to design and develop next-generation materials and integrated material systems to solve real-world challenges in fields of electronics, aeronautics, biotechnology, health, safety and security, mechanical systems, energy generation and storage, and manufacturing technology. Strengths include tailored material design, synthesis and modeling, functional materials and devices, sensors and sensing systems, drug delivery and diagnostic tools for a healthy and sustainable environment, material sourcing and supply chain management, healthy people, and improved quality of life.
- 4. Next Generation Medicine and Healthcare (NGMH)** Emerging approaches to addressing critical challenges to human health include innovative technologies for preventing, detecting, and treating disease, including therapeutic strategies as well as economic, entrepreneurship, social, and ethical challenges to health care innovation, management, and access.