

# Snowmass2021 - Letter of Interest

## *Envision Just Scientific Collaborations*

**Topical Group(s):** (check all that apply by copying/pasting /)

- (CF3) Dark Matter: Cosmic Probes
- (CF4) Dark Energy and Cosmic Acceleration: The Modern Universe
- (CF5) Dark Energy and Cosmic Acceleration: Cosmic Dawn and Before
- (CF6) Dark Energy and Cosmic Acceleration: Complementarity of Probes and New Facilities
- (CommF02) Career Pipeline and Development
- (CommF03) Diversity and Inclusion
- (CommF06) Public Policy and Government Engagement

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### **Abstract:**

Science is performed by humans, and so their health, well-being, and pursuit of success are critical to the scientific endeavor. A well-structured science collaboration should enable a scientific yield to be greater than the sum of the outcomes if the research were performed amongst independent stakeholders. In this letter of interest, we outline the challenges and recommend avenues for potential intervention and engagement towards achieving just collaborations. Collaborations should have at their core the interests of their constituent scientists: both existing and future collaborations should consider design or reform with this framing.

As science is conducted by people, and people inherently have diverse modes of communication, perspectives, and backgrounds, it behooves us to ask: what are the foundations of an ideal scientific collaboration? What structure would enable equitable and just scientific discourse among a diverse population of collaborators? What is the geometry of this structure: is it horizontal or hierarchical? In what ways should shared leadership manifest?

A scientific collaboration is a unique entity. Typically, it is a collection of scientists with a focused goal, but also with motivations that are often driven by conditions in their local institutions. Often, the competitive nature of these conditions can inhibit intra-institutional communications. Existing collaborations reflect many of the pervasive injustices present in the wider Physics and Astronomy community. These unique aspects require that collaborations carefully design themselves to create just and healthy research environments.

To address this challenge, we propose that scientific collaborations follow approaches similar to that which is outlined in the Theory of Change<sup>1</sup>, where one first identifies the desired long-term goals and then works backwards to identify specific conditions that must be met to enable the goals. This methodology shares many similarities with how we plan scientific projects --- set requirements and work backward to achieve the processes and organization that is necessary. In this case, however, we also propose that justice be the primary lens through which to identify these goals and processes.

Why do we establish collaborations? Generally, we believe that scientific collaborations exist to address a scientific problem that requires expertise from a trans-institutional collective of researchers with skill sets that are more diverse or complementary than within a single institution. Also, it more often requires “effort” or even “labor” from many early-career researchers, like students and postdocs. The scientific collaboration thus stimulates collaboration and communication between scientists, and the scientific yield of a well-structured collaboration is expected to be more than the sum of the outcomes if the research were performed amongst stakeholders independently. It is also often purported that scientific collaborations should contribute to the distribution of knowledge and the preparation of early-career researchers with uniform skills to level the uneven playing ground that has inherited the legacies of exclusion, inequity, and injustice from other research and academic environments.

In this letter of interest, to achieve some of the purported goals and benefits of multi-institutional collaborations, we recommend the following avenues for potential intervention and engagement with this challenge:

1. collect and investigate existing ideas, theories, and frameworks to construct a view of a just collaboration that can conduct ethical science (the outcome);
2. collect and analyze demographic and climate data within collaborations;
3. map out the necessary conditions for a just research environment;
4. identify constraints and boundary conditions;
5. use strategic planning methods to design and assess the success of the collaboration through the lenses of the scientific mission and the ethical and justice-oriented mission;
6. explicitly support under-represented and historically disenfranchised groups;
7. partner with experts in community organizing and anti-racism starting at the design phase of the collaboration.

Collaborations should have at their core the interests of their constituent scientists: both existing and future collaborations should consider design or reform with this framing.

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<sup>1</sup> <https://www.theoryofchange.org/what-is-theory-of-change/>