**Brainstorm on Goals and Outcomes of our Graduate Program**

**Brainstorm #1 Impact**

What should our impact on **society, education**, and **research** be?

- **Society**
  - Our students will bring physics-based techniques for solving complex problems to other domains (industries of societal relevance - tech companies)
  - To produce professionals that can use their training to make the world a better place
  - Impact on fundamental science or applications to industrial/society needs
  - Communicate science to non-scientists; Contribute to the education of future generations of scientists
  - Instill good ethical and scientific values in our students to become ambassadors of science
  - Entrepreneurship - start companies that address key challenges -- climate change, pandemics, global peace
  - Impacting science policy
    - Leading by example on inclusivity
    - The importance of evidence and data in inference

- **Education**
  - Train problem solvers, critical thinker able to accept failure
  - Developing a sense of connection between the research work and societal problems in order to justify the funding.
  - Prepare students for both independent and collaborative work. Cultivate the desire to better themselves as scientists
  - Make physics a little more of a liberal art (historical, social, philosophical dimensions)
  - Train students with the highest standards and being able to incorporate and effectively pass on knowledge to different audiences
  - Investigate potential gatekeeping practices and how these might affect people of different backgrounds
  - Investigating teaching that prepares students to do critical thinking (not just regurgitate / follow formulas)

- **Research**
  - Basic discoveries cross many fields of research and applications to societal needs
  - Emphasize the connection between different disciplines
  - Provide a broad training on how to conduct research
  - Require the ability and confidence to use their knowledge and training
  - Make physicists better at understanding the importance of evidence and contributing to societal needs
  - Build community within the department
  - Challenge norms of advising and whether these should be more adaptable for the breadth of student backgrounds

**Brainstorm #2 Outcomes**

How might we as a community achieve our impact goals?

- **Society**
  - Our students will bring physics-based techniques for solving complex problems to other domains (industries of societal relevance - tech companies)
  - To produce professionals that can use their training to make the world a better place
  - Impact on fundamental science or applications to industrial/society needs
  - Communicate science to non-scientists; Contribute to the education of future generations of scientists
  - Instill good ethical and scientific values in our students to become ambassadors of science
  - Entrepreneurship - start companies that address key challenges -- climate change, pandemics, global peace
  - Impacting science policy
    - Leading by example on inclusivity
    - The importance of evidence and data in inference

- **Education**
  - Chance to be lead instructor (summer for example)
  - Training in Course design and pedagogy
  - Requirement to teach at least once.
  - Produce scientists that care about their students, education and training
  - Be able to use different teaching styles to keep students interested
  - Make physics a little more of a liberal art (historical, social, philosophical dimensions)
  - Provide a broad training on how to conduct research

- **Research**
  - This is the primary thing for us at a major research university; without funding, without the strong research, there is no student training. So the boldface emphasis at left is more representative of a 4 year college.
  - Training students to be independent and have the ability and confidence to develop their own research direction
  - Training students to innovate with confidence and think up their own research projects and have the necessary skills to pursue them
  - Talking about physicists who are agile in the ability to learn new things and apply knowledge and techniques to new problems
  - Researchers who can invoke and training them by doing research
  - Researchers who are able to work collaboratively with a variety of people, in a variety of environments

**Departmental mission statement:** The department mission is threefold: expanding the frontiers of human knowledge through fundamental discoveries about the physical universe; training future generations of professional scientists, educators, and citizens of the world to solve complex problems using the methodology of physics; educating our fellow non-scientist citizens about important problems facing humanity through science outreach