

# CONCEPTUALIZING CASII

## *The Beginnings of the Center for Assessing Space-weather Impacts and Innovation*

A small group of heliophysicists found ourselves discussing what was needed to make transdisciplinary advancements in our research studies. There were some key points that we continually circled back upon: better understanding of the needs of those impacted by space weather (and really on a more basic level, what space weather caused impacts that people affected cared about), better communication both within the research community and with people outside of our narrow area of research, and the need to create an environment that enables better, more effective uni-, inter-, multi-, and trans-disciplinary collaborations. And although aspects of these environments and efforts can be found throughout the heliophysics research community, there was not currently a place for like-minded people to foster these collaborations and research ambitions.

As these conversations continued, the group got bigger, and more researchers expressed an interest in creating this type of dynamic community. Gaining momentum, a formal group started to solidify. Before we knew it, the idea for a center was suggested, and there seemed to be no other path forward than to be bold and embrace this opportunity. From the onset, there was a deep understanding that we must guard what made this group and center so special: a warm and inviting atmosphere where researchers could feel safe to express ideas, learn from each other, embrace new techniques, and take time to once again relish in the opportunity to become a student.

We quickly identified obstacles and concerns about cultivating this unique environment and have looked to current research and successful (and not so successful) groups as well as our own past successes and failures for solutions. Large, geographically dispersed, and highly diverse teams can suffer from misaligned goals, differences of culture, and communication. To attempt to mitigate these potential obstacles and provide a solid foundation for our center's priorities and actions, we have developed a series of philosophy statements which, in turn, can motivate and guide our methodologies and actions.

Our first philosophy statement comes in the form of a mission statement. Our mission statement addresses four questions: What do we do, how do we do it, for whom do we do it, and what value are we bringing. Although we expect that our mission statement will evolve with time, our inaugural mission statement is below:

### **The Center for Assessing Space-weather Impacts and Innovation: Mission Statement**

The Center for Assessing Space-weather Impacts and Innovation (CASII) is focused on carrying out basic heliophysics research to improve our understanding of different types of space weather events that can result in major impacts to our modern society. The key goal is to address the science and impacts identified in the National Space Weather Strategy and Action Plan. We accomplish this by bringing together international scientific experts, economists, policy experts, and the user community. Working within the Application Usability Level framework ensures that our targeted research goals will provide useful actionable information to our user communities. Our science and community-driven management philosophy allows for the flexibility necessary to respond to dynamic and changing national priorities of the technology, security, and infrastructure sectors as well as within the research community. By working with this interdisciplinary team, we are able to advance both our understanding of the Sun-Earth system and our understanding of how it impacts and affects our daily lives.

The mission statement helps us to identify to ourselves and others who we are and our global priorities. However, it is a bit long and something more like an elevator talk, so a distilled version is useful to have. This distilled version takes the form of two vision statements. As our group is forming and integrating multiple transdisciplinary groups, we feel that each of these vision statements speaks to the different communities, but are complementary:

1. The advancement of heliophysics science through transdisciplinary research.
2. The advancement of an era of frontier research, innovation, forecasting, applications, and improved operations by and for the space weather community.

The vision statements and the mission statement give our outward view to the scientific community—a solid foundation to build upon. To help us determine how we will act internally, we have developed a set of guiding principles and shared values.

Our guiding principles address the challenges of deciding on actions or activities the center would take. Each action should be defensible by our guiding principles. As with the mission statement, we expect that these guiding principles will evolve with time and experience and be reassessed at regular intervals. The following are our inaugural guiding principles:

#### Guiding Principles of the CASII:

1. Targeted research that values the needs of those impacted by space weather.
2. Community-based science through the inclusion of community voices and regular reporting to the community.
3. Constructive and supportive environment that promotes identification and acknowledgement of limits and barriers associated with research as well as successes.

To develop and sustain an environment that encourages innovative research activities and collaborations, we have identified a set of our shared values. These value statements are important for addressing any cultural differences and creating a safe environment to build strong transdisciplinary collaborations.

#### **CASII Shared Values to Promote Effective Collaborations, Goal Alignment, and the Best Science:**

1. Inclusion: Innovative, creative, and robust science and deep knowledge integration are completed through effective collaborations in which all voices are valued and included.
2. Societal Benefits: Improvements to our fundamental scientific understanding can be greatly advanced by the inclusion of stakeholder voices.
3. Diversity: Through our interdisciplinary teams bringing different perspectives, new methodologies, and experiences together, we can more effectively accomplish translational breakthroughs to our science objectives.
4. Honesty: Identifying the limits of what can be derived from our current physical understanding, data, and methodologies improves our scientific understanding of the space weather environment and how it impacts our lives.
5. Self-disclosure and self-reflection: We acknowledge that we all carry our own biases and that we are human and imperfect. With this understanding, we acknowledge that self-reflection and disclosure can help us become better mentors, collaborators, and ultimately—better scientists.
6. An environment of trust: For the free exchange of innovative ideas, there needs to be an environment and culture of trust. While we feel that the above values and guidelines should cultivate this environment, it is important to state that trust within the team and center is highly valued to ensure a healthy and safe center ecosystem.

Through the above statements and ever-evolving center philosophy, we endeavor to create a welcoming environment for scientific innovation. This set of philosophy statements allows us to build a solid foundation for team and center dynamics. We expect that there will be challenges that we will face as a community as our center grows, and these statements will enable our center to face them head-on, adapt to the ever-changing space weather community environment, and produce cutting-edge innovative and transdisciplinary research.

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