1. **State the proposed Institute/Center’s name and purpose.**

   **Name:** Center for the Communication of Science (CCS)

   The purpose of the Center for the Communication of Science is to develop and integrate collaboration between the science, technology, engineering and mathematics (STEM) fields and visual media/creative disciplines, serving as a catalyst for the dissemination and expression of science.

2. **A comprehensive statement of the Institute/Center’s mission and its relationship to the University mission.**

   **A. State the Institute/Center’s mission.**

   The Center for the Communication of Science (CCS) is dedicated to the communication and creative expression of science, technology, engineering and mathematics (STEM). CCS will develop and facilitate cross-disciplinary research among artists, filmmakers, musicians, designers, scientists, mathematicians and engineers with the goal of effectively and creatively communicating science to the public.

   **B. Identify the Institute/Center’s goals and objectives.**

   The specific goals of this center are as follows:

   1) Research and Development:

      a) To create original films, photography, music, interactive design (e.g. web, games, mobile apps), science writing, visual art and design, directly related to research in science, technology, engineering and math (STEM).

      b) Develop research on the effective communication of science within the MUS system and nationally.

   2) Dissemination: To disseminate productions developed by CCS to the public through the web, public media, screenings, exhibitions, performances and installations pertinent to STEM research.

   3) Workshops: To develop a range of instructional programs for science faculty and graduate students focused on working with visual media and media makers.

   **C. What specific need is being responded to in developing the proposed Institute/Center?**

   There are three specific needs that this Center will respond to as part of its efforts. First, within the MUS system, there are a number of outstanding STEM research programs. Funding for such high-level research programs is becoming increasingly difficult to obtain. There is a strategic institutional commitment as well as legislative interest in increasing research within the MUS system, in part, because of the documented economic impact on the state. The CCS standing as a Center at MSU will serve as a demonstrated commitment to the public dissemination of scientific knowledge – a persuasive component to high-level funding for research - as many NSF and other science granting organizations now require that the research teams demonstrate the broader impact and outreach.
components of their work.

Second, public scientific literacy levels have been estimated to be at only 20 percent comprehension. The focus on STEM education in elementary and secondary education reflects the understanding that such core skills are important for college preparation and/or professional success. The dissemination of scientific research will be focused on a lay audience. The CCS has in place a web based distribution system in its award winning Life on TERRA platform. It also is significant that Montana PBS will be an affiliated partner with the CCS so that we may repurpose the work of the Center through Montana PBS’s Learning Media Platform and provide age-appropriate science modules aligned with the common core standards to teachers across Montana and available across the country.

Third, it is hard to support what one doesn’t understand. Without public support of science, governmental funding support diminishes. Not only is there a clear need for improved communication of scientific research, but also. CCS has the capacity to develop innovative media programming, artistic representations of scientific research, through our resources, faculty and graduate students (for example graduate students in the Science and Natural History Filmmaking Program, the School of Architecture and the School of Art). Such outreach will serve to benefit the scientists in acquiring increasingly competitive grants and highlighting the prominence of their work to the public. This outreach will also benefit CAA faculty and students through opportunities for alternative funding for creative research projects. The Center for the Communication of Science will therefore provide a useful interdisciplinary service.

D. Describe how the Institute/Center benefits the department, college, or institution.

The development of this type of center spanning departments will benefit the university not only through its highly interdisciplinary nature, but also through its amplified access to grants, contracts and private donations. CCS endeavors to be a portal for scientific engagement and discovery at Montana State University.

E. Describe the Institute/Center’s relationship to the University mission.

As the state’s land grant institution, MSU’s mission “educates students, creates knowledge and art and serves communities by integrating learning, discovery and engagement.”

The proposed Center for the Communication of Science is firmly aligned with this mission.

**Educates students:** CCS will educate students through the development and dissemination of scientific communication content and through workshops designed for faculty and students. Not only will students be on the receiving end of the content produced by CCS, but they will also be involved in developing the content.

**Creates knowledge and art:** CCS will serve as a bridge for the creation of knowledge and art, as well as developing original work that enhances our understanding and appreciation of science.

**Serves communities by integrating learning, discovery and engagement:** The proposed goals of CCS inherently serve communities by integrating learning, discovery and engagement across disciplines. CCS will strive to disseminate all its products to local, regional and national communities.
3. Briefly describe the Institute/Center’s anticipated activities.

CCS will develop films (including documentary, narrative and experimental), photography, interactive design, architectural design, science writing, visual art and music directly related to scientific research. The Center will also engage in promoting science through high-quality video abstracts and video publications for online science journals. Workshops will complement the Center’s objectives by providing training to STEM faculty and students in effective science communication. Although much of this integrative research activity is already occurring within the College of Arts and Architecture, this center will be a catalyst to stimulate and streamline the interdisciplinary efforts. CCS will collaborate with Montana PBS on developing modules for PBS Learning Media to accompany films. Life on TERRA, the award-winning online distribution platform created by the Science and Natural History graduate program will be incorporated in CCS, thereby providing an additional outlet for the distribution of films and interactive media produced by the center.

A. Identify faculty expertise available for participation in the Institute/Center’s activities.

Below are the visual and creative faculty members who have thus far confirmed that they are interested in participating in the Center’s activities. They are professional artists and media makers and are available to bring the communication component to bear.

- Dennis Aig – Professor, Director of the School of Film & Photography
- Christina Anderson — Associate Professor of Photography
- Linda Antes – Assistant Professor of Music
- Jason Bolte – Assistant Professor of Music
- Julia Cory – Assistant Teaching Professor of Music
- Kathy Kasic – Assistant Teaching Professor of Film / Science and Natural History Filmmaking
- Theo Lipfert – Associate Professor of Film
- Sara Mast – Associate Professor of Drawing, Painting and Foundations
- Meta Newhouse – Associate Professor of Graphic Design, Founding Director Designed Sandbox for Engaged Learning (DSEL)
- Alexis Pike – Assistant Professor of Photography
- Melissa Ragain – Assistant Professor of Art History
- Lucia Ricciardelli — Assistant Professor, Film & Media Studies
- Gianna Savoie — Assistant Teaching Professor, Science and Natural History Filmmaking
- Tobin Stewart – Assistant Professor of Music
- Cindy Stillwell – Professor of Film
- Tom Watson – Associate Professor of Theatre
- Jim Zimpel — Assistant Professor of Sculpture

STEM faculty can be found below.

B. Which departments on campus will be involved and how will the Institute/Center contribute to the academic programs of the institution?
We have highlighted at least 23 departments, programs or research groups at Montana State University who have expressed a desire to work with the proposed Center for the Communication of Science. This was determined by personal communication with deans, department heads and program directors. The following individuals have expressed their support and interest for collaboration with the proposed Center:

- Office of Research and Economic Development: Renee Reijo Pera, Vice President of Research & Professor in the Department of Cell Biology & Neuroscience
- Center for Biofilm Engineering: Phil Stewart, Director
- Chemical and Biological Engineering Department: Jeff Heys, Department Head & Associate Professor
- College of Letters and Sciences: Nic Rae, Dean
- College of Agriculture: Charles Boyer, Dean and Director
- Department of Animal and Range Sciences: Patrick Hatfield, Professor
- Department of Cell Biology and Neuroscience / Center for Mental Health Research and Rehabilitation: Frances Lefcort, interim Director
- Department of Earth Sciences: Julia Haggerty, Assistant Professor
- Department of Ecology: Al Zale, Affiliate Professor, Director of the Montana Cooperative Fishery Research Unit
- Department of Ecology: Christopher Guy, Affiliate Associate Professor
- Department of Ecology: Molly Webb, Affiliate Faculty Member and Physiologist at the Bozeman Fish Technology Center
- Department of Mathematics: Beth Burroughs, Associate Professor
- Department of Microbiology and Immunology: Blake Wiedenheft, Assistant Professor
- Department of Plant Science and Plant Pathology: John Sherwood, Professor and Department Head
- Department of Plant Science and Plant Pathology: Michelle Flenniken, Assistant Professor
- Department of Political Science: Elizabeth Shanahan, Associate Professor
- Electrical and Computer Engineering Department: Rob Maher, Department Head, Professor and Affiliate Professor of Music
- Extended University: Suzi Taylor, Assistant Director of Outreach and Communications
- Extension: Jeff Bader, Director
- Institute on Ecosystems (IOE): Cathy Whitlock
- Land Resources and Environmental Sciences: John Priscu, Professor
- Land Resources and Environmental Sciences: Tracy Sterling, Professor and Department Head
- Montana Space Grant Consortium: Angela DesJardins, Director

Academic programs in the arts and sciences thrive when they are mutually informing. Teaching STEM students to navigate science communication and expression early in their career will give them the competitive advantage they need in the future. Graduate students in STEM will benefit from CCS through increased access to high-quality outreach early in their careers, as well as the training workshops designed by CCS. Students across the College of Arts and Architecture will benefit from the establishment of the Center. Through our funding model, we plan to provide financial support for GRAs and undergraduates whose studies are relevant to the research projects at hand.
4. Identify the organizational structure of the Institute/Center within the institution.

The Center will provide a structured environment for collaborative research among the fields of science, engineering, technology, film, art, music and design at Montana State University. CCS will be housed in the College of Arts and Architecture with a small operations budget and office space provided by the College. It will have an appointed Center Director, currently structured as a faculty work distribution from teaching and research at .33FTE (the replacement costs for any subsequent course coverage covered by the College of Arts and Architecture). Additional staffing: Graduate research assistants and/or staff will be added as grant resources support.

A. Identify all agencies, organizations and/or institutions that will be involved.

Collaborating organizations and institutions may include, but are not limited to: Center for Mental Health Research and Rehabilitation, Center for Biofilm Engineering, Montana Cooperative Fishery Research Unit, Bozeman Fish Technology Center, Extended University, Extension, Institute on Ecosystems (IOE), and Montana Space Grant Consortium

5. Identify first year and continuing finances necessary to support the Center/Institute, including the sources of funding.

We plan to phase this program in by the 2016 academic year. The program will be housed in the College of Arts and Architecture (CAA) at MSU. Initial steps will be to coordinate meetings and forums with STEM departments, apply for grant funding, seek private donations and establish a web presence. The Center possesses a Founding Director (Kathy Kasic), who CAA is internally covering her 30-35% annual buyout, a successful web distribution portal known as Life on TERRA, funding for one graduate assistant and tuition waiver, office space for the Center, basic operations funding and in-kind resources from the School of Film and Photography in the form of camera equipment, sound equipment, accessories and studio space. Kathy Kasic is applying for an NSF grant as a Co-PI with Dr. John Priscu and others, through the Office of Polar Programs. Pending support this grant will be the first grant to run through the Center and will provide funding for three film productions, web development, an experimental film installation, one-month faculty summer salary, one GRA and one undergraduate student to serve in the Education and Outreach wing of the grant. Kasic is also working with the Department of Animal and Range Sciences on a USDA-NIFA proposal, which would provide funding for one undergraduate student scholar in Photography to shoot and exhibit photographs of sustainable organic farming. Once the Center is established we will continue to search for funding for operations and additional projects.

A. Will additional faculty and other resources be required to implement this Center/Institute? If yes, please describe the need and indicate the plan for meeting this need.

Additional faculty and resources will be recruited as needed on a case-by-case basis, according to individual grant-based need. The goal is to provide support via grants or private donations for two staff members: a Project Manager and a Project Researcher.

B. Are other, additional resources required to ensure the success of the proposed Center/Institute? If yes, please describe the need and indicate the plan for meeting this need.

It is likely that we will need to purchase our own equipment to reduce equipment strain on the
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departments. This will be developed through a combination of grants and private funding.

6. Describe other similar Centers/Institutes or research capacities in the state and surrounding region.

A. Describe the relationship between the proposed Center/Institute and any similar Centers/Institutes, programs, or research capacities within the Montana University System.

There are no existing programs within the MUS system that focus on science communication on a research level. There is a program in Science and Natural History Filmmaking, however it is a curriculum-based, Masters of Fine Arts program within the School of Film and Photography. Within the curriculum, students may make films about science, but it does not actively promote the academic research and the subsequent funding of science communication. The development of CCS will therefore not duplicate any existing programs.

B. In cases of substantial duplication, explain the differences between these and the need for the proposed Center/Institute at an additional institution. Describe any efforts that were made to collaborate with these Centers/Institutes, programs or research capacities. If no efforts were made explain why.

n/a

7. Assessment: How will the success of the program be measured?

Success is measured by three key metrics:

1) Tracking outreach of program – how are the products of the CCS are being used and viewed?
2) Tracking feedback on the impact of the products on the larger populations (reviews, awards, teacher feedback)
3) Financial sustainability. The Center will be self-sustaining financially by providing compensation for Director, staff and researcher/visual/creative partners. This funding will, beyond base operations, be secured through external grants.

8. State the internal campus review and approval process, which has occurred prior to submission to the Commissioner's Office. Indicate, where appropriate, involvement by faculty, students, community members, professional constituencies, etc.

The initial process of developing this Center began with discussing the proposal with deans, department heads and faculty throughout the university. These discussions lead to letters of support for the Center, which we have attached with this proposal. The proposal was sent to the Faculty Senate prior to its submission to the Board of Regents.