NARRATIVE

1) Need for the Project – National Magnitude/severity of the problem:

It has been more than fifty years since C.P. Snow warned that a breakdown in communication between the sciences and humanities would prevent us from solving our problems [1], yet rancorous debate on energy issues suggests that not only does this gap still exist, but it is widening[2]. In an age where so many of the problems the nation faces require scientific knowledge and public engagement in the scientific process, little attention is paid to science communication, especially the training of innovative science communicators skilled in working with today's media.

This communications gap cuts across all science, technology, engineering and mathematics (STEM) fields[3], and is particularly apparent in the largest scientific organization in the world, our National Laboratories, where world-class research is being conducted that has immediate application to critical energy issues, climate change and more. But for the most part, the public is unaware, disinterested, and/or lacks opportunities to enter into this discourse. Compounding the problem, scientists themselves are often ill-equipped or unskilled at communicating their efforts. [45]This science communications deficit is further complicated by the fact that learning and communication tools in a fast-moving digital age are in transition. [6]How can content and messages be created in a way that reach a generation raised in the digital age? What kinds of new media, communication and artistic skills need to be honed to explain current science to the public? What communication skills are needed that can reach far beyond television, classroom lectures and conventional outreach efforts? How can today's interactive digital media and social networks be leveraged effectively to produce not only a scientifically literate society, but one that is fully and actively engaged in scientific discourse?[7]

SMILE Science US (SMILE) proposes the *SciMedia Initiative*, a collaboration that closes the gap between the sciences and the humanities, and improves postsecondary education by training future science communicators to play a major role in science communication by developing an innovative path to career training that combines academic and experiential learning in a real-world science setting.

National Implication - Major national studies, including “Rising Above the Gathering Storm,” 2007 describe America’s drop in science literacy and lack of students in sciences, and the attendant effect of these conditions to the country’s world standing in research, engineering, and economics. According to a report given at last year's American Association for the Advancement of Science meeting, scientific literacy among adults has increased over the past twenty years, but remains small (28% of the total population). High school students continue to score below Europe on science achievement tests and the number of students pursuing science degrees continues to fall prompting warnings of a deficit in a technically trained work force severely impacting our ability to maintain our global competitiveness.The National Laboratories have

warned that they will not be able to fill their job openings in the coming years.[8][9][10][11][12]

Current debates over issues such as climate change underscore the importance of proper understanding of scientific matters related to policy-making. These issues also point to the importance of communicating science in ways that go beyond understanding the processes and content of science, to engaging the public in ways in which they can find personal relevance and response to the scientific issues of the day.

The need to move beyond awareness to elicit other affective responses such as enjoyment, interest, and developing science related attitudes cannot be met only by enhancing formal science education at either the K-12 or postsecondary levels. Learning science, gaining understanding and developing a science identity are lifelong processes also supported through many informal outlets including clubs and organizations, museums and the plethora of growing electronic media opportunities. Yet without science communicators who know how to use their chosen medium effectively *and* "get the science right," the results are "science-lite" offerings that do not meet the needs of the lay public, the scientists, or the country. [13][14]

How problem has been addressed in the past - Significant efforts over the past fifty years have encouraged students to pursue careers in science and technology. Most of these programs emphasize active engagement in scientific research preparing students to pursue jobs as scientists, engineers and science teachers. Science communicators either come at it by default, or are drawn from a pool of aspiring scientists offered degrees in writing, such as MIT's one-year master's degree in science writing, Johns Hopkins University's Masters of Arts in Science Writing, and the science communication program at the UC Santa Cruz among others. A survey of universities offering undergraduate and graduate degrees in science communication compiled by the University of Wisconsin-Madison in 2007[15] indicate that most of these programs are offered through the school of journalism with an emphasis on training students to become reporters for print or electronic media. Yet traditional journalism majors are shrinking as print media organizations scramble to redefine themselves.[16]These programs are based on the assumption that students already have an active interest in and knowledge about science and need only training in technical aspects of writing and communications, thus excluding a large segment of creative and talented students who could bring insight and innovation to science communication.

Conversely, programs in communication (visual / media) arts are expanding rapidly, but without many models for linking with traditional academic disciplines like STEM. Cultivating digital visual literacy among undergraduates is increasingly important to produce citizens who are able to comprehend and generate complex ideas in today's increasingly visual environment.[17] According to an assessment by the Educause Learning Initiative, "visuals created with new technologies are changing what it means to be literate. In the 21st Century, the ability to interpret and create visual, digital, and audio media is a form of literacy as basic as reading and writing text. Visual literacy is required of us as much as textual literacy. Most academic programs, however, are centered on reading and writing words. We must expand our concept of literacy to

match the reality of today."[18] Communication Arts programs focus on teaching technique, but the need within higher education is for interdisciplinary pedagogues that merge new media forms with traditional content.

Training research scientists to become better communicators of their work is addressed at The Mass Media Science and Engineering Fellowship program at the American Association for the Advancement of Science offering a ten-month internship to practicing research scientists in media organizations [19]giving scientists a much better understanding of how to work with 'media types,' but it does not overcome the fact that scientists are paid to do research, not to communicate science to the public. While they may find the latter enjoyable and rewarding, it inevitably falls to the bottom of the to-do list.

How project addresses the central causes of the problem - The *SciMedia Initiative* will give communication arts students access to the finest science of our time, while providing new avenues for scientists to communicate their research. This project will harness the creative powers of communication arts students as they apply innovative ways to communicate National Lab research to target audiences by assuring the media is relevant and engaging.

The *SciMedia Initiative* will address the lack of trained science communicators skilled in electronic media art forms by providing a nationally replicable model that specifically targets students interested in developing current communication arts skills and trains them to be exquisite communicators of science. Students will gain valuable experience working with science, learning science concepts and producing media that fulfills the learning needs of specific target audiences.

The *SciMedia Initiative* will address the problem of "science-lite" programming that scientists often criticize as "dumbing down" their work for general audiences by creating partnerships between researchers at the National Labs and communication arts students. In addition to university faculty, student work will be evaluated and approved by seasoned science media producers.

The *SciMedia Initiative* will challenge emerging electronic media professionals to apply innovative storytelling to important science, while at the same time, challenging scientists to make their content accessible and relevant to the public; encouraging communication arts innovation for both storyteller and researcher, spreading the burden of clear communications to both scientist and student to present a story that is relevant, engaging and accurate, and therefore, a scientist less wary of the public and the public less wary of the scientist. This initiative will support the Obama Administration's commitment to STEM, by nurturing a "new generation" of science media producers that communicate stories to the public, while unleashing the potential of the National Laboratories to contribute to science literacy nationwide. Finally, this initiative will demonstrate the availability of a replicable model that encourages other researcher / storyteller collaborations between Universities and National Laboratories across the U.S.

Local and national consequences of a successful completion of this project - Senior level communication arts students will gain real world experience by applying academic training to scientific research activities, while developing a science media portfolio, resume' and demo-reel for careers that bridge training to science-based communications careers. National lab scientists will gain insight into how to work with 'media types' and better communicate their stories to general audiences. The public will benefit from media produced by student/scientist teams by enriching the experience of other undergraduate students and encouraging them to pursue careers as science communicators.

Evaluating this pilot over the three-year period will help other communication arts programs adopt this model. It may also result in additional opportunities to encourage humanities students to consider careers as science communicators.

Finally, successful completion of the *SciMedia Initiative* will provide a greater awareness about the importance of science communication as a distinctive, vital career field of national importance in its own right.

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2) Significance of the project

National significance of the proposed project - The digital age offers seemingly boundless outlets, yet there remains a paucity of quality and innovative science media that engages audiences and promotes science literacy. The *SciMedia Initiative* serves the national STEM education by sowing seeds to create a new generation of professional science media producers who will “feed” new science media content of all kinds.

The introduction of National Labs scientists into the postsecondary teaching process, will contribute to a new standard in science literacy among students in an innovative way, along with the results of creating media intended to generate interest in science careers. Like the newly minted collaboration between NSF and USC's School of Cinematic Arts that launched the Creative Science Studio, also known as CS2, students are applying cinematic arts to inspire mass media audiences about science and engineering concepts.[20]

In a similar collaboration, SMILE has established relationships with San Francisco State University (SF State) and its Broadcasting Electronics Communication Arts (BECA) program, and Lawrence Livermore National Laboratory and the National Ignition facility laser fusion research center (LLNL - NIF) of the Department of Energy (DOE), for this same purpose. This collaboration complements the Obama Administration recently recognizing that our National Labs offer great richness of content and a wealth of research as potential contributors to the public understanding of science, as well as Obama's "Educate to Innovate" campaign, meant to motivate and inspire students to excel in science, technology, engineering and mathematics (STEM).[21] [22]

The *SciMedia Initiative* intends to tap into this national goldmine of scientific content by using a dynamic mixture of SF State Communication Arts students, faculty and media professionals, working with National Laboratory scientists to nurture a new generation of science communicators. Over the course of three years, a pilot initiative will be built, proof of concept will be demonstrated and increased, and program expansion will be tested by scaffolding 2-year community college students to the program. A handbook will be developed that offers a roadmap for replication of this model at other 2 and 4 year postsecondary institutions, National Labs and local school districts across the U.S. This initiative has great potential to be expanded at the pilot sites, and replicated at 16 other DOE National Labs and _____ Universities and Colleges offering communication (media) arts programs across the U.S. that not only create new solutions for addressing scientific literacy, but advance a specialty field of science communication arts.

Development / demonstration of new strategies that build on existing strategies - The *SciMedia Initiative* strategy prepares senior communication arts majors for possible careers in science communication through building mentorships with media professionals who have spent careers communicating science, and by working with National Lab scientists to tap the science content for the purposes of producing innovative and engaging science media. As an example, students may be asked to produce media that explores R&D efforts and that might fundamentally change the way energy is produced by significantly changing the “carbon footprint” of world energy consumption.

The *SciMedia Initiative* intends to facilitate a new strategy that: a)Significantly enhances postsecondary communication arts teaching methods by introducing a science theme focus; b) Exposes National Lab scientists with little expertise in public communications; c) Provides student access to “real scientists” and a scientific method as a guiding principle towards the production of media targeted at a youth audience, and an opportunity to explore a communication arts specialty; d) Offers a clear path for Community College communication arts students to complete a four-year postsecondary education; and, e) Engages seasoned science communication mentors as executive producers, facilitators, media disseminators, and media advisers / reviewers to assure student-produced media meets key education standards.

The *SciMedia Initiative* pairs communication arts students with media professionals through a specially-designed course that let students apply their knowledge in a workplace, offers mentorships, and internships and helps them make the transition from student to professional. It offers communication arts students the opportunity to produce quality STEM based media projects that can be widely distributed, while enhancing their portfolios and demo-reels that will give them a competitive edge in the work place. It encourages 2 year to four year transitions for increased postsecondary completion and success. It offers an alternative to recruiting science communicators from scientists training to become better communicators, or using their science expertise to pursue "alternate" career paths. Instead, the initiative engages communication arts students

who have shown clear interest and a capacity to communicate, and trains them in how to collaborate with researchers.

The goal in Year-One of the *SciMedia Initiative* is for five (5) SF State communication arts students to produce three (3) science stories for incorporation into the LLNL *Scientists in the Classroom* webcast, a real-time interactive program with 'scientists in their natural habitat,' that fosters an interactive scientist/student dialog with the San Ramon Valley Unified School District by incorporating the excitement and immediacy of National Lab research directly into the 21st Century classroom STEM education experience.(See appendix) As an example, webcasts feature scientists from LLNL's Center for Accelerator Mass Spectrometry (CAMS), whose research covers a wide variety of scientific fields ranging from the migration patterns of dinosaurs, to environmental cleanup and management solutions; biomedical research exploring problems like what the age of the DNA is in our brains; determining ocean circulation models by examining deep-sea corals and more. Communication arts students will interact directly with the scientists / researchers working at CAMS. Integrated into these laboratory-webcast streaming feeds will be SF State student-produced media of case-in-point field research, interviews, or other relevant science content. Students will gain unprecedented access to National Lab staff experiencing firsthand, interaction with scientists exploring the latest in science and clean energy solutions.

The SF State science-focused communication arts course will be ramped-up in Year-Two by expanding the number of student deliverables to five (5) science stories. Program expansion is tested again in Year-Three with the production of six (6) science stories to be incorporated into the LLNL *Scientists in the Classroom* webcast. Students from Las Positas Community College in Livermore, CA will scaffold to the SF State - BECA science course, and will be responsible for producing (1) of (6) stories with the support of SF State.

The SciMedia Initiative provides an avenue by which postsecondary students can focus efforts on producing "professional-level quality material" and in the process, enhance the role of the university. It enables communication arts students to actively produce science-based media that builds value to their skills and portfolios, and makes them competitive in the marketplace. Finally, it enables National Labs to be active participants in STEM work unleashing a vast, untapped resource that contributes to a scientifically literate public.

Potential replicablity of strategies, and implementation in a variety of settings

Student-produced media are not simply "senior thesis projects." Rather, they are professionally created science-based media productions that can potentially be widely distributed. Initial dissemination of student media in Year-One will be through the LLNL webcasts and a robust, project web portal that features student-produced science media, National Lab webcasts, and will, over the course of the three-year start-up and beyond, capture, and be the point of dissemination for all resulting media from these

collaborations. Distribution mechanisms will be explored and expanded through NOVA, National Geographic TV and other national sources in Years-Two and Three of the initiative, including within the California State University system. The intent is to create a model that can be “replicable” and easily modeled in other postsecondary settings, initially within the SCU system, and then well beyond with other interested schools like Emerson College in Boston and University of Alabama at Birmingham. With 17 DOE National Laboratories throughout the US, there is a large range for this initiative to be duplicated geographically, by “connecting” other postsecondary institutions with other National Labs, scientists, students, and more media outlets.

3) Quality of project design

SMILE works through a fiscal sponsor to assure that government and other funding is properly and professionally managed. For this purpose, we have chosen Community Initiatives (CI) of San Francisco, CA. The mission of CI is to facilitate nonprofit activity that benefits the public good by providing fiscal sponsorship and back office services to organizations that do not yet have their own 501(c)(3) status. Such organizations are often start-ups in incubation mode or are projects of limited duration. SMILE Science US, is a fiscally sponsored project of CI.

SMILE will be working with San Francisco State University (SF State) and its Broadcast and Electronic Communcations Arts (BECA) program, in collaboration with LLNL, and with additional advisory support from NOVA and National Geographic TV.

The SciMedia Initiative is designed with the emphasis on “form following function” so that communication arts students grasp technique in service of content to determine "what works" in presenting effective scientific media for various targeted audiences.

Project collaborators will participate in the process of an early planning session and selecting “case study” science story assignments. SF State faculty will select Communication arts students from the SF State/BECA program to interact with media professionals and LLNL scientists, and to establish a set of science media standards for determining what makes effective scientific communications for public consumption.

SMILE will also be developing, testing and initially disseminating student-produced science media on a project web portal.

The project Science Advisory Board includes William Bruner III, Director, Office of Government and External Relations, LLNL; Edward Moses, Principal Associate Director for NIF and Photon Science Directorate, LLNL; Maryanne Culpepper, Executive VP, Editorial & Business Development, National Geographic TV; Melanie Wallace, senior series producer, NOVA; Scott Patterson Ph.D., SF State/BECA Department Chair, Faculty; Lena Zhang Ph.D., SF State/BECA faculty; as well as members of SMILE. All will be participating in the debate, review and exploration of what makes good and effective science communications. Media products produced by students will be evaluated in the classroom and with the advisory board before being considered

acceptable for dissemination through the LLNL *Scientist in the Classroom* webcast, any online web portal, or in a public science center setting.

Extent project addresses the needs of target population or other identified needs

The *SciMedia Initiative* is designed to address needs of four primary target populations:

1) Communication Arts and journalism students in Jr/Sr years;

- Developing a stable of science-savvy media professionals who are comfortable working with, and including, STEM content and ideas in media;
- Providing greater access to the world-class scientists and innovative STEM research underway at National Labs as sources of science stories for students to produce science-based media while pursuing communication arts degrees and careers;
- Providing communication arts students with opportunities to produce innovative STEM stories in new media formats;
- Enabling emerging communication arts students to receive training that combines academic and multidisciplinary production experience that will further prepare them to enter the professional workforce while improving the quality of portfolios, demo-reels and work samples;
- Creating greater promotion and dissemination opportunities for student – produced science media stories through laboratory-hosted webcasts, the project web portal, and other informal media distribution partnerships.

2) Postsecondary faculty of undergraduate emerging communication arts scholars;

- Participating in the creation of new models for dynamic, multidisciplinary media courses which require collaboration by students from communication arts programs to create stories about unique STEM research underway at National Labs;
- Engaging science media professionals and public education organizations to assist with the design of the multidisciplinary courses, and to participate in the process of story assignments and evaluation of student media productions;
- Developing new models for science communication career training that combines academic and experiential learning that is also based upon professional standards of leading science media and organizations like NOVA, National Geographic Television, ATSC and others.

3) Postsecondary students not in communication arts or science programs;

- Engaging college-level freshman /sophomores in a survey of what media works;
- Determining if exposure to student-produced science media changes level of interest in exploring science-based classes or careers.

4) STEM researchers and programs at National Labs;

- Providing greater opportunities for world-class STEM researchers at National Labs to communicate their work to the public, including the taxpayers who ultimately support their research;
- Inspiring the next generation of scientists to pursue STEM-related postsecondary education and provide greater media coverage of their work to the public by having their stories told;
- Exposing National Lab research activities by making it more accessible to youth.

Project implementation, and the use of appropriate methodological tools

Implementation of the *SciMedia Initiative* is planned so it will grow each year. Year-One will be used for planning the purposes of developing a *prototype* that includes story selection, media production, evaluation and dissemination. During this period, three LLNL stories identified by the team and will be chosen for production by the university participants. Three media pieces will be produced by student teams with guidance by faculty and SMILE media experts, then evaluated by members the media advisory board with representatives from each collaborating organization and other expert informal science members. Students will be required to revise media as recommended. When student-produced media is advisory board-approved, it will be disseminated through the LLNL Public Affairs Office to the San Ramon Livermore Valley Schools via a lab-hosted 'Scientist in the Classroom' streaming webcast. A project web portal will also be designed during Year-One with input from the collaborating organization and advisory board. It will be nexus of information and used as a database for all *SciMedia Initiative* produced products and for dissemination of media to other outlets.

In Year-Two of the *SciMedia Initiative*, (6) media pieces will be produced, (5) by SF State and (1) by PPCC students, about LLNL science using a similar evaluation and implementation process, including incorporating any course correction to streamline the process. The purpose of Year-Two will be to *ramp up* production volume and make needed adjustments. Again, final media will be incorporated into the lab-hosted, streaming webcasts. In addition, the project web portal will be launched and populated with science-based student media, lab broadcasts, and more.

In Year-Three, *expandability* of the project will be tested by creating a partnership between a 4-year institution, SF State, and 2-year institution, Las Positas Community College. In this way, transfer articulation could be streamlined between 2 and 4-year schools using the content of this project as the medium of exchange. To accomplish this, (6) media pieces will be created; (5) at SF State, and (1) at LPCC. The effectiveness of the project web portal will be assessed and enhanced and other public dissemination options for student-produced media will be added, like science centers and festivals. Throughout the course of the entire three year *SciMedia Initiative*, independent evaluation at critical junctures will be taking place. The following lists the proposed order of process:

1) Communication arts students / media faculty, are teamed with veteran media producers and National Lab scientist(s) who is conducting energy solutions research;

2) Team works to create a shared understanding of issues, such as: research and its implications, needs of general audiences, limitations and/or potential of specific media to present research; 3) The team agrees on a particular media and designs work to implement the approach using available assets and new techniques; 4) Student-produced media is reviewed periodically by an advisory team that includes faculty, lab science scientist and outreach, informal learning mentors, and NOVA and National Geographic TV representatives; 5) Final student-produced media product are incorporated into LLNL-hosted webcasts into the San Ramon Valley and other School Districts; 6) Final student-produced media product is incorporated into project web portal; 7) Final student-produced media product is offered to the public at a science-based festival or science center and will be released under a creative commons license to encourage wide distribution and reuse; 8) After a prototype is developed in Year-One, production volume is ramped up in Year-Two, and in Year-Three, the initiative is expanded to a 2-year college as a bridge to postsecondary completion; 9) Independent evaluation of the project by Randi Korn & Associates Inc. occurs throughout the three year initiative. Details of this process are included in section 4 of this narrative.

Building capacity and yielding results beyond FIPSE - The proposed SMILE *SciMedia Initiative* is designed to be easily replicable at other higher education institutions nationwide. Communication Arts degree programs are extremely popular among students in these fields and provides ample opportunities to disseminate the *SciMedia Initiative* model well beyond the life of the FIPSE grant. Of particular value will be the ability to create a 2-year and 4-year college/university collaboration. It is apparent that this initiative will be of interest to National Academy of Sciences, The Gordon and Betty Moore Foundation, The Alfred P. Sloan Foundation, and the Department of Energy, Office of Science grants.

The project's focus on high profile STEM research occurring nationwide at the network of 17 DOE National Labs and their geographic proximity to higher education institutions with communication arts degree programs helps assure the project's replicability and continuation beyond the life of the FIPSE grant. *The SciMedia Initiative* is designed to build on and expand the capacity of existing National Lab programs like the *Scientist in the Classroom* that webcasts scientists into local classrooms and is intended to simulate student interest and enable learning in the fields of science and technology by using real-world research being conducted at the Laboratory. Additional funding is being sought by the lab through the EERE program that supports DOE energy outreach and education, a program that is also looking to support projects that can be replicated across the country.

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4) Quality of the project evaluation

Summary - Randi Korn & Associates, Inc. (RK&A) will conduct three phases of evaluation:

1. The front-end evaluation will review current collaborations between university departments and science labs to identify their successes and shortcomings. Our

intention is to leverage the best characteristics, processes, and collaborative strategies of current work to create a successful collaboration model for communicating science to postsecondary students.

2. Formative evaluations will be conducted in Year-One and Year-Two. At the end of Year-One we will conduct a process evaluation to explore how to strengthen the collaboration, given its unique structure (e.g., scientists working with university students from a range of disciplines) and desired results (concrete strategies for communicating scientific information). In Year-Two, we will field test communication arts strategies through student-generated media productions so the team can identify what is working and what is not in the context of the science communication objectives determined during the planning phase.

3. In Year-Three RK&A will conduct a summative evaluation using qualitative and quantitative data collection strategies to measure the project's results according to the outcomes listed in Figure 1 located in the appendix section. .

Methods of evaluation, performance measures; Summative Evaluation -The summative evaluation will begin with a planning meeting between RK&A and the project team to clarify the specific intentions of the study, including the lingering questions the team has about the project and media productions. The overall purpose of the summative evaluation is to measure results against original outcomes, as presented in Figure 1. Given the evolving nature of collaborations, we will review the original outcomes of the project to ensure that the summative evaluation will still be measuring the achievement of those outcomes, as well as any others that may have emerged during the process. As a deliverable of the planning meeting, RK&A will refine the outcomes, re-clarify the evaluation methods, and propose a working schedule for completing the evaluation. It should be noted that two of the outcomes require baseline measures (students from across disciplines learn science communication strategies, and students' attitudes towards science and scientists improve). As such, a standardized questionnaire will be designed, pre-tested, and administered to students in Year-One; it will be re-administered to students in Year-Three. RK&A will develop and pretest all other summative evaluation data collection instruments in Year-Three, after the planning meeting, and seek team approval.

Data collection instruments will include a standardized questionnaire (which will produce numerical data) and an open-ended interview guide. To obtain a high response and completion rate, we will offer students an incentive such as a gift certificate to Amazon.com. RK&A will write the specific interview questions based on the queries voiced during our initial planning meeting. After drafting an interview guide and the team approves it, we will pre-test it, after which we will seek final approval. We propose conducting 40 student interviews over the telephone.

We will audio record all interviews with the interviewees' consent. Audio recording allows us to listen to what respondents are saying and ask probing questions as necessary. We will produce full transcriptions, giving us an accurate, objective account of all conversations. As a result of their conversational nature, qualitative interviews elicit descriptive, detailed data. In analyzing qualitative data, we study responses for meaningful patterns. As patterns and trends emerge, we group similar responses together.

The final report will present a thorough analysis of data from both methodologies. Descriptive data generated through the in-depth interviews will be analyzed in the qualitative tradition: that is, major trends and themes in data will be presented, with verbatim quotations (edited for clarity) exemplifying those themes. Numerical data generated from questionnaires and observations will be presented using text, graphs, and tables. The final report will include an executive summary, a methods description, and a list of recommendations.

Replication or testing in other settings; Front-end Evaluation - To assist our team in building and strengthening the collaboration model for producing media that focuses on science communication, our evaluator will conduct a front-end evaluation. The intent is to conduct a review of existing collaborations between science researchers in laboratories and university departments that are equipped to produce state-of-the-art media. The front-end evaluation will identify where such collaborations are taking place, the unique characteristics of these existing partnerships, what they produce, their successes, and their shortcomings. Additionally, our evaluation will identify evaluations of these collaborations as well as evaluations of communication arts programs designed to communicate science and summarize findings so we can learn from others' work. We hope to build on the work of others and create a collaboration that is forward-thinking in its approach, actions, and deliverables. The front-end evaluation will be among one of the first tasks for our team. A final report will summarize results of the landscape study and present suggestions for the collaboration moving forward.

Formative Evaluations - Year-One - During Year-One, the *SciMedia Initiative* will focus on laying the groundwork for the collaboration. The team will be clarifying team members' roles, identifying criteria for selecting stories, and identifying criteria of successful science communication media. Similarly, we will be learning how to work together as a team, given the varying cultural environments, specifically a university and a science laboratory. Thus, the first formative evaluation will take place at the end of Year-One. It will be designed to help us analyze our process and determine what worked and what did not, as we move into the second year of the collaboration. Our intent is to have RK&A conduct a process evaluation so our team can understand the challenges and opportunities of the collaboration and to perfect the collaboration model so universities/laboratories that want to communicate and disseminate science content can replicate it. The process evaluation will involve RK&A conducting up to 30 qualitative interviews with participating scientists, faculty, and students about their specific roles and how they think the collaboration can be strengthened. They will also be asked to identify specific action steps they and others might take to improve the working process. We will audio record the interviews with interviewees' consent and conversations will be transcribed and analyzed to facilitate analysis. A final report will be submitted to the team.

Year-Two- By Year-Two, the production team will have identified stories and the students will be producing media following the criteria articulated during Year -One. Using the criteria as guideposts, collaborators will develop up to five productions, each one focused on a distinct communication/presentation strategy previously identified.

While our intent is that the productions will teach science content, we look to formative evaluation to identify which strategies are most/least successful for communicating science. Using university assets (e.g., classrooms of postsecondary students) and existing relationships among university departments, RK&A will field-test these productions with non-science major students. After viewing a program, RK&A will facilitate class discussions to determine successful media strategies and identify weak ones for remediation. The intent is to provide feedback very rapidly to the production teams so they can address the productions' shortcomings and re-produce footage as necessary.

A set of open-ended questions will guide the class discussions. RK&A will ask probing questions to garner specific information about how to improve science communication. Students' feedback will be audio recorded, transcribed, and analyzed. The team will receive a final written report with specific recommendations.

5) Adequacy of resources

Costs in relation to the objectives, design, and potential significance - Funding identified for SMILE in the role of executive producer, project management, facilitation, evaluation, and science media expertise is justified based on current non-profit rates. It is anticipated that, in addition to the in-kind efforts the SMILE team has made to date, additional in-kind time will be spent to launch the *SciMedia Initiative* above beyond the estimated funding for planning and implementation. Costs have been estimated on a per-program basis so we feel adequate time is allotted. Additional funding will also be requested from other grant sources outside the FIPSE grant.

Funding identified for the SF State is justified and important for the purposes of participation in the development of this unique initiative and requires the attentions of a knowledgeable university point person to coordinate efforts and manage participating faculty. Faculty, in turn, will choose students and participate in mentoring and evaluating student media. To assure students consider the importance of these assignments, students will be offered a stipend to make the project assignments "real" and as an added incentive for actively participating in the *SciMedia Initiative* pilot program.

Funding was identified for participation by LLNL in the design process because National Lab funding for outreach and educational efforts is almost non-existent. Because the *SciMedia Initiative* is a unique concept outside the normal responsibilities of a laboratory scientist, it will take time away from their normal research responsibilities and therefore, requires an outreach-related funding account to cover this time. Development of the initiative will require the attention of a knowledgeable point person whose time would be paid for by LLNL in the National Lab Public Affairs Office to coordinate efforts between researchers, scientists and lab TV staff, as well as coordination at the San Ramon Livermore Valley School system teacher prep level.

Use of fiscal sponsor CI is based on the desire to be extremely responsible with all funding and in particular, federal funding. Instead of expanding to handle these responsibilities internally, SMILE became a fiscally sponsored project of CI in July 2009 and provides financial and grants management, and HR services. As part of the appendix, please find a copy of the fiscal sponsorship agreement and FSP services list.

Commitment partners to the project's implementation / success

Each *SciMedia Initiative* partner has expressed a deep understanding that a need exists for this work. Each believe a disconnect exists in "marketing" science to the public, and that the SMILE *SciMedia Initiative* is a long-term solution that will help to fill this gap. The message is eminently simple, the need, painfully obvious, and an otherwise powerful message is lost in details, or because of overly political wording. They all agree that educating the public on advanced scientific issues is increasingly important to fundamental issues of US policy and have provided letters of support for this initiative.

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