

REPORT OF THE FINAL PANEL
BOARD OF REGENTS SUPPORT FUND
INDUSTRIAL TIES RESEARCH SUBPROGRAM
FY 2008-09

BACKGROUND INFORMATION

Thirty-five research proposals requesting a total of \$2,862,326 for the first year of work were submitted for funding consideration during fiscal year (FY) 2008-09 in the Industrial Ties Research Subprogram (ITRS) component of the Board of Regents Support Fund (BORSF). Of the thirty-five proposals submitted one contained information of a confidential or proprietary nature. A three-phase evaluation process conducted exclusively by out-of-state experts was used to review these proposals.

REVIEW PROCESS

Phase I: In Depth Mail Review

The thirty-five proposals were reviewed for scientific and technical merit, as well as for their potential to contribute to Louisiana's economic development and diversification, by twelve out-of-state experts. The experts included two reviewers in each of the following six subject areas: agriculture, aquaculture, and animal science; biotechnology and health care; chemical materials and petroleum engineering; computer and information sciences; mechanical and materials engineering; and environmental science & technology and urban development. Each subject area mail reviewer independently evaluated and prepared an in-depth evaluation form for each assigned proposal in the subject area.

Phase II: Reviewer Consensus Evaluation

After each reviewer independently reviewed each assigned proposal, members of the various subject area groups communicated with each other to arrive at a consensus ranking of proposals within each subject area. Proposals were placed in one of three categories:

1. Priority One: Highly Meritorious Proposals Recommended for Funding;
2. Priority Two: Meritorious Proposals of a Lower Priority; and
3. Priority Three: Do Not Fund as Submitted.

Copies of all evaluation forms from out-of-state experts who participated in Phases I and II of the review process were forwarded to each member of the final panel, along with copies of all proposals submitted. Each member of the final panel read and studied each proposal and each evaluation prior to the final panel's meeting.

Phase III: Final Panel Review

Three out-of-state experts participated in Phase III of the review process and served on the final panel. The panel convened in Baton Rouge on February 12-13, 2009, to discuss Phase I and II subject area evaluations, prioritize awards, and develop funding recommendations. The final panel considered each of the thirty-five proposals extensively and based its recommendations on the following criteria:

- A. Scientific and technical merit;
- B. Potential to enhance economic development and/or diversification in Louisiana;
- C. Evidence of private sector involvement; and
- D. Evidence of innovation and ability to advance Louisiana's scientific, engineering, and/or technological bases.

The panel was informed that a maximum of \$558,800 would be available in first-year funds for new research projects in the ITRS in FY 2008-09, and that money to continue the second or third years of multi-year projects recommended for funding would be budgeted separately from this amount. As a result of the final panel's deliberations, eight proposals and one alternate (in the event that one of the higher-ranked applicants declines an award) were recommended for funding. These eight Priority One proposals and one alternate are listed in **Appendix A**, immediately following the narrative section of this report. The final rankings and selections for awards were based upon individual ratings of the external reviewers (Phase I), the consensus rankings of the subject area reviewer groups (Phase II), and the final panel's (Phase III) consensus evaluation, taking into account the projects' economic potential.

Five other highly meritorious proposals considered at the final panel meeting but, for a variety of reasons, not recommended for funding, are listed in Appendix B. (See Appendix B, which lists proposals placed in the Priority One category by the subject area panels that were not recommended for funding by the Final Panel). Each applicant whose proposal is listed in Appendix B should closely review the reviewers' comments. The final panel believes that these investigators should be notified of their good work and encouraged to revise and resubmit their proposals in the future, with the prospect that improvements in proposal content could ultimately lead to an award. These proposals, listed in numerical order in Appendix B, should not be funded this year. The Board of Regents Support Fund would be better served by diverting any available funds not awarded to and/or unclaimed by Priority One projects to other R&D program component(s).

Four other proposals were considered meritorious by both the Subject Area Reviewers and the Final Panel, but insufficiently developed in one or more areas to be worthy of funding at this time (Priority Two).

Each of the seventeen remaining proposals, although meritorious in some respects, was deemed inconsistent with the goals and purposes of the ITRS and/or seriously deficient in one or more areas (Priority Three). The principal investigators who submitted these proposals are encouraged to submit them to other, more appropriate funding programs or to make significant revisions before considering resubmission to the ITRS.

The panel recommends that the Board of Regents commit funding for each new proposal for a maximum of three years, with renewal in the second and third years made contingent upon satisfactory progress as well as reconfirmation of continued external matching funding. External stipulations and institutional matching requirements applicable in general to the eight Priority One proposals and one alternate

are contained in **Appendix C (C.1)**. The specific levels of outside funding required and detailed stipulations or conditions applicable to each proposal are included in the discussion of the eight Priority One proposals and one alternate listed in **Appendix C (C.2)**. Summary statements have been provided in **Appendix C** for each Priority One (C.2), meritorious ITRS proposal ranked Priority One by the subject area panels and considered by the final panel but not recommended for funding (C.3), and Priority Two (C.4) proposals. These summaries include the following information for each proposal:

1. Proposal number and title;
2. Strengths and weaknesses of the proposal;
3. Potential economic impact on Louisiana; and
4. Recommended BORSF funding level and funding stipulations, as applicable. (*Note:* This information is provided only for the eight proposals and one alternate recommended for funding and included in Priority One).

A general statement on proposals ranked Priority III by the final panel is included in **Appendix C (C.5)**.

The individuals who participated in Phases I and II of the review process are listed in **Appendix D**.

In depth mail reviews will be provided as feedback to all applicants in July 2009.

FINAL PANEL RECOMMENDATIONS

To Phase I and Phase II Subject Area Reviewers:

Reviewers should be commended for their performance in accordance with the guidelines set forth in the FY 2008-09 Request for Proposals.

To the Applicants:

Applicants should be commended for their efforts to obtain industrial support and for proposing research in areas with high economic potential. Several of the proposals were not supported by strong research plans which included a testable hypothesis. Improving the quality of this section of the ITRS proposals would help ensure that this program contributes to strengthening the academic mission of the supporting university or institution.

Each proposal submitted should include the following information or plan of action:

1. A one-page summary describing the research in layman's language and assessing its technology transfer potential;
2. An assessment of the supportive science and interdisciplinary expertise needed to enhance the potential success of the research, including joint research activities with other researchers or research groups at the same or other institutions;

3. A description of industrial participation representing a true collaboration; including past, scheduled, and potential contacts and visits to and from industry, as well as scheduled or potential contributions of funds, equipment, and services by industry; and
4. Identification of an existing industry that will utilize proposal results or of a new industry to be created through the proposed research.

To the Board of Regents: General Recommendations

Over the years there has been a substantial improvement in obtaining Industry and non-academic support as well as development of solid research plans. It is important to encourage these improvements through the following (5) processes:

1. Continue to provide workshops and seminars for faculty on developing proposal preparation and requirements; development of consortia and cooperative research centers; patent and licensing procedures; and technology transfer to commerce.
2. Ensure that funded projects obtain the required industrial matching support. Principal investigators should be required to document acquisition of the recommended level and types of industrial matching support by June 30, 2009, for the required first-year matching commitment; by March 31, 2010, for the required second-year match; and by March 31, 2011, for the required third-year matching commitment. The staff of the Office of Sponsored Programs should further promote recognition around the state that the ITRS not only encourages but requires industrial and/or federal governmental support as a condition for funding. Significant external funding is often necessary to purchase equipment and to fund salaries.
3. Notify applicants that literature reviews, the development of databases, and the drafting of research protocols should take place prior to submission of a proposal. These activities should not be funded by the ITRS of the Board of Regents Support Fund.
4. Notify applicants that the industrial support obtained should be incorporated in the budgets of proposals under the appropriate line items.
5. Where appropriate, request applicants to include more detailed information regarding current and potential intellectual property rights with their proposals.

APPENDIX A

ITRS PROPOSALS HIGHLY RECOMMENDED FOR FUNDING
(PRIORITY ONE)

Rank	Proposal No.	Institution	Recommended BORSF 1 st Year Funds	Recommended BORSF 2 nd Year Funds	Recommended BORSF 3 rd Year Funds
1	025B	LAT	\$ 60,000	\$ 60,000	\$ 58,000
1	034B	ULL	92,000	89,000	79,000
1	018B	LSU-BR	93,000	78,000	79,000
1	024B	LAT	64,000	64,000	64,000
1	023B	LAT	66,000	50,000	50,000
1	009B	LSU-BR	35,000	33,000	-----
1	017B	LSU-BR	86,000	83,000	-----
1	005B	LSU-AG	<u>62,800</u>	<u>55,000</u>	<u>-----</u>
TOTAL			\$ 558,800	\$ 512,000	\$ 330,000
ALTERNATE					
9	035B	UNO	63,000	63,000	63,000

APPENDIX B

MERITORIOUS ITRS PROPOSALS RANKED PRIORITY ONE BY THE SUBJECT AREA
PANELS AND CONSIDERED BY THE FINAL PANEL BUT NOT RECOMMENDED
FOR FUNDING (5)

002B
021B
027B
030B
031B

Note: These proposals are not listed in rank order of merit. The Panel's comments on these proposals are provided in **Appendix C.3**. Subject Area panel reviews for each proposal will also be provided to the applicants in July 2009.

**APPENDIX C
MERITORIOUS ITRS PROPOSALS OF LOWER PRIORITIES**

PRIORITY TWO*

007B 020B
013B 026B

PRIORITY THREE*

001B 014B
003B 015B
004B 016B
006B 019B
008B 022B
010B 028B
011B 029B
012B 032B
033B

Note: *These proposals are not listed in rank order of merit and are not recommended for funding as currently submitted. The Panel's comments on the proposals ranked Priority Two are provided in **Appendix C.4**. Subject Area panel reviews for each proposal will be provided to the applicants in July 2009.

APPENDIX C.1

GENERAL EXTERNAL AND INSTITUTIONAL MATCHING REQUIREMENT STIPULATIONS FOR ITRS AWARD RECIPIENTS

External (i.e., industrial or approved governmental) and institutional funding commitments may not be reduced below levels pledged in the original proposal unless reductions are specifically permitted in the funding stipulations for a grant. In some cases, additional external funding over and above that pledged in the proposal (see Appendix C.2) may be required. The types and amounts of additional required funding are specified in the funding stipulations for the affected awards. **Unless otherwise indicated, all awards are contingent upon receipt by the Board no later than June 30, 2009, of updated documentation from the provider(s) of the external match reconfirming provision of the match pledged in the proposal. Furthermore, second-year funding will be contingent upon receipt by the Board no later than March 31, 2010, of updated documentation from the provider(s) of the external match reconfirming provision of the required second-year external match. Third-year funding will be contingent upon receipt by the Board no later than March 31, 2011, of updated documentation from the provider(s) of the external match reconfirming provision of the required third-year external match. Letters (originals) from the private sector or government agency providing the required match must be provided to the Board on company or agency letterhead and signed by authorized representatives of the companies or agencies by these same dates.**

Although budget requests from the Board of Regents Support Fund have been reduced significantly in some cases, no budget has been reduced to a degree that would impair execution of the proposed research and accomplishment of the project goals. **Therefore, funding for each recommended Priority One project is made contingent upon full and complete execution of the work plan delineated in the proposal.**

**APPENDIX C.2
COMMENTS AND FUNDING STIPULATIONS FOR
PROPOSALS HIGHLY RECOMMENDED FOR FUNDING
(PRIORITY ONE)**

Proposal 025B

Rank: 1

TITLE: *Optical Instrument for the Real-Time Estimation of In Vivo Nanoparticle Concentration*
 INSTITUTION: Louisiana Tech University
 PRINCIPAL INVESTIGATOR: D. Patrick O’Neal, Ph.D.

COMMENTS: Many research groups are employing increasingly complex nanoparticles for oncological applications to deliver bioactive, therapeutic, or imaging compounds to known and unknown *in vivo* tumor targets. Nanospectra Biosciences, Inc. (Houston, TX) is currently, testing a biocompatible nanoparticle, the AuroShell™, in several oncological pre-clinical and clinical applications. In an ideal clinical study, each subject of similar weight and tumor-burden would be injected with an identical number of nanoparticles in order to achieve an identical therapeutic result. However, this level of experimental homogeneity is not always achieved. While several imaging techniques have been previously shown to follow the accumulation of AuroShell particles into tumor targets, a more rapid quantifiable estimate of dose delivery and short-term systemic response could increase the clinical efficacy and greatly reduce the variability in these treatments. The research will join Louisiana Tech University Biomedical Engineering and Nanospectra Bioscience, Inc., in an effort to develop a clinical prototype to address three clinical goals: (1) real-time feedback for practitioners to provide instantaneous initial dose verification, (2) real-time feedback providing therapeutic dose verification (np*min/mL), which is a pharmacokinetic analysis integrating the delivered dose and the circulation time, and (3) an alarm system which identifies an uncharacteristic circulation time which could help predict a physiological reaction to the nanoparticles and which may require a medical intervention.

The proposed research is interesting but there are two major drawbacks: (1) it is designed to work with a proprietary nanoparticle (AuroShell™ a product of Nanospectra Biosciences) and hence will have limited utility and; (2) the site interrogated must be optically accessible. A characteristic of the AuroShell nanoparticles are that they absorb strongly in the infrared at frequencies which penetrate tissue. Much to the benefit of this proposal, the investigator notes that Louisiana Tech has joined with LSU Health Sciences-Shreveport in developing unique nanoparticles which will be biologically and optically active, capable of detection by the proposed instrument. The preliminary data presented is convincing and there is a high likelihood of success. The use of the proposed device in validation studies is exciting and the reviewers wonder whether the investigator considered attempting to measure tumor accumulation directly at optically accessible sites. Although AuroShell particles have been considered as a therapeutic modality they might well have a role in diagnostic applications. The necessity for optical accessibility might not be a drawback in certain applications. This is a very well written proposal that provided good background information although, not directly relevant to the proposed device, but demonstrates the potential clinical utility of the AuroShell particles in murine tumor models using photothermal tumor ablation. The PI is well qualified to conduct the proposed research and has a limited but pertinent publication record in generation and characterization of nanoparticles for biomedical applications. The letter of support from Nanospectra Biosciences, Inc. pledges \$21,000 in-kind support for the first year and similar resources for two additional years, although the proposal indicates \$21,186, \$22,109, and \$23,096, respectively. Prior to funding an updated letter of support must be obtained reflecting this commitment. Additionally, the proposed budget should be revised to limit travel support to \$2,000/year. The PI is required to maintain support for one graduate research assistant at the level proposed in the original budget in all three years of the project.

As a condition of funding, the types and amounts of the institutional and external matching commitments stated in the proposal should be maintained in full. Funding is contingent upon receipt by the Board no later than June 30, 2009 of updated documentation showing support at the levels indicated in the original proposal and as required in Appendix C.1.

BUDGET	BORSF	EXTERNAL
1 st Year	\$60,000	\$21,186 as specified in the proposal
2 nd Year	\$60,000	\$22,109 as specified in the proposal
3 rd Year	\$58,000	\$23,096 as specified in the proposal

Appendix C.2 (continued)

Proposal 034B**Rank: 1**TITLE: *Metal-Catalyzed Group Transfer Reactions*

INSTITUTION: University of Louisiana at Lafayette

PRINCIPAL INVESTIGATORS: Radhey Srivastava, Ph.D.

COMMENTS: The importance of commercial utility of saturated and unsaturated amine is well established in the production of petroleum additives, cationic surfactants, fabric softeners, etc. Fine chemicals, polymers, and pharmaceuticals are one of the growing industries. Polymers are considered Louisiana's most important contribution to the US economy. It is understood that every hour, a railcar full of polyethylene leaves just one of many polyethylene plants that accounts for 40% of beverage containers. There is, however, a large gap between producing raw materials and manufacturing value-added finished products. Generally, polymers processing simple amines such as polyvinylamine are difficult to prepare and the synthesis route needs several steps. The University of Louisiana at Lafayette and Albemarle Corporation (Baton Rouge) seek to design cost-effective, environmentally friendly catalysts for the synthesis of amines.

This proposal is an interesting extension of prior work using metal catalysis (iron, copper) and more specifically will focus on producing metal catalysis for use in imido (RN) and nitroso (RNO) group transfer agents. The research will be expanded to attempt enantioselective reactions with the ultimate goal of devising a pilot plant synthesis. Although the work is basic in nature, a better understanding of catalysis in the target area may lead to new products and processes in the catalytic production of stereo specific allyl amines. The PI has considerable experience in the area and is well qualified to carry-out the proposed work plan. The proposed budget on the other hand appears excessive and should be reduced to limit travel support to \$2,000/year, supplies to \$11,000, and to eliminate computer and printer costs. The requested support for a post-doc is justified, but some assurance that this person will be hired is needed. The pledged support of \$40,000/year in-kind from Albemarle Corporation in the form of technical support, equipment, and facility usage appears adequate.

As a condition of funding, the types and amounts of the institutional and external matching commitments stated in the proposal should be maintained in full. Funding is contingent upon receipt by the Board no later than June 30, 2009 of updated documentation showing support at the levels indicated in the original proposal and as required in Appendix C.1.

BUDGET	BORSF	EXTERNAL
1 st Year	\$92,000	\$40,000 as specified in the proposal
2 nd Year	\$89,000	\$40,000 as specified in the proposal
3 rd Year	\$79,000	\$40,000 as specified in the proposal

Appendix C.2 (continued)

Proposal: 018B**Rank: 1**

TITLE: *Development of Geopolymer-Based Smart Bonding Materials for Distributed Optic Fiber Sensor Applications to Infrastructures*

INSTITUTION: Louisiana State University – Baton Rouge

PRINCIPAL INVESTIGATORS: Guoping (Gregg) Zhang, Ph.D.; Steve C.S. Cai, Ph.D.

COMMENTS: The US infrastructures, particularly bridges, water and sewage systems, and oil and gas pipelines, are deteriorating at an alarmingly accelerating rate, causing a real threat to safety, economy, and human life. Urgently needed are implementable, economical, durable, and quantitative sensing systems for large-scale infrastructure monitoring. Fiber optic sensor (FOS) systems have the greatest promise to fulfill this need. However, large-scale installation of optical fibers onto existing structures remains a critical issue and obstacles for FOS applications in practice. Louisiana State University and A&M College in collaboration with OZ Optics Limited (Canada) and Advanced Cement Technologies, LLC (Blaine, WA) seek: (1) to develop a novel class of geopolymer-based smart bonding materials for use with optical fibers forming a large-scale, long-term distributed infrastructure monitoring system; (2) to demonstrate through prototype testing the feasibility and implementability of the integrated geopolymer-FOS sensing technology and; (3) to develop a mechanism for transferring the developed sensing technology. Louisiana has the longest total mileage of bridges over coastal wetlands and waters, which are frequently subjected to impact from hurricanes, storms, and wave surges. More, importantly, the new sensing technology can significantly reduce the economic loss and even loss of lives caused by infrastructure failures (e.g., bridge collapse).

The proposed research seems reasonable but there is nothing novel about the use of optical fibers to form distributed integrity monitoring systems. The problem being addressed is the development of a new class of adhesives that has appropriate mechanical properties (including cost, durability, and controlled cracking strain to also provide deformation information) which makes retrofitting of distributed sensor cables feasible. Geopolymers are synthetic mineral products that appear to have the appropriate properties. The idea seems plausible, although a description of competitive adhesives/strategies should have been included in the proposal. Additionally, the performance measures for the research were not specifically stated and should be addressed prior to funding. Nevertheless, the principal investigators are well qualified to carry out the proposed work plan. There is good industry support from OZ Optics Limited (\$70,000 cash and in-kind) and Advanced Cement Technologies, LLC, (\$18,288 in-kind). This support must be maintained throughout the project. The proposed budget requires a minor revision that limits travel support to \$2,000/year. The principal investigator is also required to maintain support for two graduate research assistants at the level proposed in the original budget in all three years of the project.

As a condition of funding, the types and amounts of the institutional and external matching commitments as stated in the proposal should be maintained in full. Funding is contingent upon receipt by the Board no later than June 30, 2009 of updated documentation showing support at the levels indicated in the original proposal and as required in Appendix C.1.

BUDGET	BORSF	EXTERNAL
1 st Year	\$93,000	\$36,096 as specified in the proposal
2 nd Year	\$78,000	\$26,096 as specified in the proposal
3 rd Year	\$79,000	\$26,096 as specified in the proposal

Appendix C.2 (continued)

Proposal 024B**Rank: 1**TITLE: *Clay Nanotubes for Controlled Release of Corrosion Inhibitors*

INSTITUTION: Louisiana Tech University

PRINCIPAL INVESTIGATORS: Yuri Lvov, Ph.D.

COMMENTS: Construction and petroleum are major Louisiana industries and improving corrosion protection is an important task for the state. In the US, billions of dollars are spent annually for protection of metal construction from oxygen corrosion. A big variety of corrosion protection methods such as cathodic protection, protective coatings, etc. has been introduced and corrosion prevention with inhibitors is one of the most effective methods. Especially difficult is the situation of sustained corrosion protection that appeared after 2007 when using the most common hexavalent chromium coating was forbidden because of health (cancerogenic) and environmental issues and the need for the development of the next generation of corrosion protection based organic chelating materials became urgent. Louisiana Tech University's Institute for Micromanufacturing and NaturalNano Inc. (Rochester, New York), seek to develop new anticorrosion additives to metal coating based on encapsulation of current standard protective agents in nanotube clay containers. This approach will provide sustained treatment with the protective agent enhanced release in the corrosion spots. Both oxidation and biological corrosion protection will be developed. With biological corrosion the proposed research will concentrate on antimolding protection through the same nanocontainer formulation approach. Antimolding protection is especially important for post-Katrina restoration in New Orleans.

The proposed research to use naturally occurring halloysite nanotubes as controlled release devices for anticorrosion agents is very innovative, but there are questions that still remain regarding whether or not the degree of time delay and controlled releases are sufficient. Nevertheless, the research is of economic importance. The proposal is detailed and supported by preliminary data but there is a bit of skepticism about the claimed ease of end plugging (stopper and nanoshell formation) that is a major goal of the project. The pledged support of \$30,000/year in-kind from NaturalNano, Inc. appears adequate for the proposed work and the budget is reasonable with the exception of \$1,000 in operating cost, which should be deleted. The principal investigator is required to maintain support for one graduate research assistant at the level proposed in the original budget in all three years of the project.

As a condition of funding, the types and amounts of the institutional and external matching commitments as stated in the proposal should be maintained in full. Funding is contingent upon receipt by the Board no later than June 30, 2009 of updated documentation showing support at the levels indicated in the original proposal and as required in Appendix C.1.

BUDGET	BORSF	EXTERNAL
1 st Year	\$64,000	\$30,000 as specified in the proposal
2 nd Year	\$64,000	\$30,000 as specified in the proposal
3 rd Year	\$64,000	\$30,000 as specified in the proposal

Appendix C.2 (continued)

Proposal 023B**Rank: 1**

TITLE: *Sensory System for Critical Infrastructure: Defect Recognition, Visualization and Failure Prediction*

INSTITUTION: Louisiana Tech University

PRINCIPAL INVESTIGATOR: Erez N. Allouche, Ph.D; Neven Simicevic, Ph.D.; Klaus Grimm, Ph.D.

COMMENTS: Buried pipe systems deteriorate over time under the action of various applied and environmental loads, chemical and microbiological induced corrosion, and differential settlements. A key for effective infrastructure management practices is the availability of reliable and timely inspections data that serves as the basis for timely selection of proper rehabilitation methods. Closed-circuit television (CCTV), the most common inspection technology used by US municipalities, is limited to visually detecting defects on the inner wall of the pipe. Defects hidden beneath encrustation, cement mortar lining or a thermoplastic liner, as well as voids immediately outside of the pipe, are currently difficult if not impossible to detect. These hidden defects could lead to the collapse of the buried structures, loss of service, environmental spills, damage to adjacent infrastructure (e.g., road surfaces), and in some cases injuries and loss of life. Louisiana Tech University, in collaboration with Cues, Inc., and its Louisiana-based subsidiary, Beyond Vision, LLC., seeks to develop sensing technology based on ultra-wideband pico-second electromagnetic pulses for detecting “below surface” defects, corrosion, and out of pipe voids in non-metallic buried pipes.

This is an excellent proposal with a good chance for success, where the economic benefits would be high; however, there exist some technical problems with actual system deployment. The development seems to be in the very early stages but the university facility (Trenchless Technology Center and the Center for Applied Physics) seems well positioned to follow through with development which is incremental and aims to increase spatial resolution. The principal investigator has a good grant and publication record and has assembled a qualified team of researchers. The proposed budget is relatively reasonable but requires some revision that limits travel to \$2000/year, BoRSF equipment support to \$11,250 to reflect the 25% in-cash institutional match of \$3,750, and deletion of printing charges. The pledged industrial support of \$50,000 cash and \$120,000 in-kind from Cues and Beyond Vision, LLC is good indication of their commitment to the project. Additionally, the principal investigator is required to maintain support for one graduate research assistant at the levels proposed in the original budget.

As a condition of funding, the types and amounts of the institutional and external matching commitments stated in the proposal should be maintained in full. Funding is contingent upon receipt by the Board no later than June 30, 2009 of updated documentation showing support at the levels indicated in the original proposal and as required in Appendix C.1.

BUDGET	BORSF	EXTERNAL
1st Year	\$66,000	\$50,000, as specified in the proposal
2nd Year	\$50,000	\$60,000, as specified in the proposal
3 rd Year	\$50,000	\$60,000, as specified in the proposal

Appendix C.2 (continued)

Proposal 009B**Rank: 1**

TITLE: *Evaluation of the Thermal Performance and Cost Effectiveness of Radiant Barrier Thermal Insulation Materials in Residential Construction*

INSTITUTION: Louisiana State University – Baton Rouge

PRINCIPAL INVESTIGATOR: Marwa Hassan, Ph.D.

COMMENTS: Reducing heating and cooling system loads in buildings is a cost effective method to decrease energy consumption in residential houses. This reduction can be achieved in many ways, including proper insulation of the building envelope. In recent years considerable attention was given to the use of radiant reflective insulation barrier. As a result, reflective barrier insulation companies nation-wide have experienced significant growth, resulting in an industry average growth rate of 26.8%. This significant growth has not been felt by the radiant barrier industry in Louisiana. This is mainly due to the lack of knowledge and the amount of research available in quantifying radiant barrier thermal effectiveness for hot and humid climatic conditions widely encountered in Louisiana. Louisiana State University Construction Management and Industrial Engineering, in collaboration with RoyOMartin Lumber Co. (Alexandria, LA) and RIMA International (Olathe, KS), seeks to develop a simple estimating tool that may be used by homeowners, stage agencies, and contractors to assess the effectiveness and economic benefits of radiant barrier insulation systems under the climatic conditions in Louisiana.

This is a well written proposal where the primary goal is to carefully evaluate and quantify the energy savings and economic benefit of radiant barrier, given the climate and common building practices in Louisiana. The problem is quite complex, involving conduction, convection, thermal transfer and variables such as air and moisture movement. The finite element analysis is elegant but the problem may well be too complex to meet the objective and for end user use. Field measurements and building occupant comfort are important aspects that could be added to the study. Nonetheless, the work plan appears reasonable and the proposed budget is modest, yet appropriate. The letter of support from industry partner (RoyOMartin) was strong and a good indication of their commitment to the project. A letter from the Reflective Insulation Manufacturers Association (RIMA) conveyed support for the project, but unfortunately without any cash or in-kind commitments. There were however, claims of a workshop in year three (this is a two year project) that should be clarified. The principal investigator is required to maintain support for one graduate research assistant at the levels proposed in the original budget in all three years of the project.

As a condition of funding, the types and amounts of the institutional and external matching commitments stated in the proposal should be maintained in full. Funding is contingent upon receipt by the Board no later than June 30, 2009 of updated documentation showing support at the levels indicated in the original proposal and as required in Appendix C.1.

BUDGET	BORSF	EXTERNAL
1 st Year	\$35,000	\$2,499 as specified in the proposal
2 nd Year	\$33,000	\$4,998 as specified in the proposal

Appendix C.2 (continued)

Proposal 017B**Rank: 1**

TITLE: *Cognitive Radio and MAC Layer Enhancements for Wireless Communication Networks*

INSTITUTION: Louisiana State University-Baton Rouge

PRINCIPAL INVESTIGATOR: Shuangqing Wei, Ph.D.; Rajgopal Kannan, Ph.D.

COMMENTS: Catastrophic events such as hurricanes lead to a rapid and often dramatic deterioration in the performance of wireless adhoc and cellular networks. These networks are the primary means of communication between first responders and impacted citizens and performance degradation can severely impact the type and quality of emergency response provided to survivors. There are three primary network conditions that lead to performance degradation during times of systemic stress: (1) System Overload; (2) Channel Quality and; (3) Spectrum Availability. LSU Electrical & Computer Engineering has teamed with Bascom Hunter (Louisiana technology start-up company) and L-3 Communications (Bristol, PA) to develop a “cognitive radio technology” for use with wireless communication and radar. The system will be designed to optimize frequency, space and time utilization by having “intelligent nodes” which actively analyze data to determine optimal bandwidth and channel.

The proposed research is strong in algorithm development and presents a logical first step, but there are certain elements of the proposal that are likely to be used in secure military communication systems and the interest in radar did not seem justified. Bascom Hunter (B-H) has laudable interest in the project but is unlikely to be able to further develop the support infrastructure that will be needed. Ultimately, strong support for hardware development will be necessary by a major player such as the US Department of Defense. For this reason it is recommended that the ITRS provide funding for two years in lieu of the three years requested. The proposed travel budget appears excessive and should be limited to \$2,000/ year. The increased funding by B-H for graduate students over time is a good indication of their level of commitment to the project, but the letter of support from L-3 Communications is unclear relative to the engineering support (in-kind) that will be contributed. As a condition of funding, updated letters from B-H on company letterhead reconfirming their support for the project and L3 Communication detailing their support must be obtained. The principal investigator is also required to maintain support for two graduate research assistants at the levels proposed in the original budget for each year of the project.

As a condition of funding, the types and amounts of the institutional and external matching commitments stated in the proposal should be maintained in full. Funding is contingent upon receipt by the Board no later than June 30, 2009 of updated documentation showing support at the levels indicated in the original proposal and as required in Appendix C.1.

BUDGET	BORSF	EXTERNAL
1 st Year	\$86,000	\$12,000 as specified in the proposal
2 nd Year	\$83,000	\$19,000 as specified in the proposal

Appendix C.2 (continued)

Proposal 005B**Rank: 1**TITLE: *Development of Safe and Ready to Eat Frozen Oyster Products*

INSTITUTION: Louisiana State University-Agricultural Center

PRINCIPAL INVESTIGATOR: Subramaniam Sathivel, Ph.D.; Beilei Ge, Ph.D.;
John Finley, Ph.D.; Joan King, Ph.D.

COMMENTS: Louisiana annually produces 250 million pounds of “in shell” oysters. For generations the oyster industry has been one of the economic engines in Gulf of Mexico coastal communities. If the gulf cost oyster industry is to remain viable, consumers must be reassured that oysters are of the highest quality and safe to eat and that modern post-harvest technology is a cornerstone of the industry. The production and processing industries provide approximately 4,800 jobs in Louisiana and developing frozen products that are safe and ready-to-eat would provide an opportunity for the Louisiana Oyster industry to market their products during the entire year. Louisiana State University Agricultural Center, in collaboration with Joey Oysters, (Amite, LA) seeks to develop new, high quality, and safe products that contain both oyster and vegetables using high pressure, modified atmospheric packaging, and cryogenic freezing technologies.

Although this is strictly a developmental proposal it is clearly written and has a high likelihood of success. Combinations of high pressure sterilization, freezing technology (blast versus cryogenic) and packaging (steam venting versus non-steam venting) in modified atmosphere (CO₂ + N₂) will be evaluated and subjected to consumer acceptance testing involving industry personnel. Procedures are well described but a statement that no test material will be released from batches prior to microbiological safety testing should be included, as non-high pressure sterilized material will be tested. The PIs are well qualified and all have the appropriate backgrounds to conduct the proposed research. The budget appears inflated both in terms of personnel and time, and provisions for a research associate and graduate (Ph.D.) student are not warranted. Additionally, the project should be limited to two years of support in terms of the goals/objectives to be accomplished—the third year is not justified. Therefore, based on these assessments, the proposed budget should be revised to eliminate printing charges of \$750, limit travel support to \$2,000/year and replace funding support for a Research Associate with funding for two graduate research assistants (Ph.D.), which are a better fit for the proposed project. The industrial support of \$22,000/year cash and in-kind appears adequate for the project.

As a condition of funding, the types and amounts of the institutional and external matching commitments stated in the proposal should be maintained in full. Funding is contingent upon receipt by the Board no later than June 30, 2009 of updated documentation showing support at the levels indicated in the original proposal and as required in Appendix C.1.

BUDGET	BORSF	EXTERNAL
1 st Year	\$62,800	\$22,000 as specified in the proposal
2 nd Year	\$55,000	\$22,000 as specified in the proposal

Appendix C.2 (continued)

Alternate - To Be Funded Only if one of the Higher-Ranked Applicants Declines an Award**Proposal 035B****Rank: 9**

TITLE: *Multiple Model Fault Detection and Diagnosis with Application to Large-Scale Automated HVAC Systems*

INSTITUTION: University of New Orleans

PRINCIPAL INVESTIGATOR: X. Rong Li, Ph.D.; Vesselin P. Jilkov, Ph.D.

COMMENTS: According to the Department of Energy, about 53% of building energy end-use in America is spent on HVAC and lighting, for a total expenditure of \$192.5B in 2006 dollars. The total energy usage when lighting is excluded is 35.3% (or \$138.7B). Some type of fault detection can make a big difference in the efficiency of a building. While abrupt faults are often safety issues, incipient faults are more of a maintenance of efficiency concern. This is because, at the early stages of failure, units with incipient faults will still be able to maintain set-point targets; however, they will have to work harder to do so. Commercial buildings waste an estimated 15% to 30% (\$20.8B-\$41.61B annually) of their energy due to poorly maintained, degraded, or improperly controlled equipment. Additionally, buildings which do not necessarily have any incipient or abrupt faults, but which have been optimized for HVAC can see performance improvements of 5% to 32% (\$6.94B - \$44.38B annually) in annual energy consumption for light and HVAC. Some of these suboptimal design decisions or miscalibration issues are considered “pre-existing” faults. The primary target economic sector of this proposal is the control and automation industry. Process control and industrial automation has an extremely important presence in Louisiana. They are key enabling technologies in the petro-chemical industry. Operations of thousands of off-shore platforms in the Gulf of Mexico rely on these technologies. The University of New Orleans, in collaboration with Computrols, Inc., (New Orleans, LA) and Omni Technologies, Inc., a local IT company, will seek to develop, demonstrate, and implement a novel approach to fault detection and diagnosis (FDD) for dynamic systems with multiple operational modes when the information about modes (e.g., faults, number of modes, data generation mechanism) is incomplete or missing. The primary application domain will be large-scale heating, ventilation, and air-condition (HVAC) systems, which collect vast amounts of data on hundreds or thousands subsystems.

The proposal is well written and the principal investigators have strong backgrounds in algorithm development. While HVAC automation is targeted, the number of users willing to commit to high-level automation should be explored as part of the commercialization process. The industrial support by Computrols, Inc., and Omni Technologies, Inc., of \$67,000, \$68,000, and \$69,000 cash and in-kind respectively, indicate their commitment to the project. The budget is relatively reasonable and will require a revision that limits travel to \$2,000/year, and elimination of printing charges. The principal investigator is also required to maintain support for two graduate research assistants at the levels proposed in the original budget for each year of the project.

As a condition of funding, the types and amounts of the institutional and external matching commitments stated in the proposal should be maintained in full. Funding is contingent upon receipt by the Board no later than June 30, 2009 of updated documentation showing support at the levels indicated in the original proposal and as required in Appendix C.1.

BUDGET	BORSF	EXTERNAL
1 st Year	\$63,000	\$67,000 as specified in the proposal
2 nd Year	\$63,000	\$68,000 as specified in the proposal
3 rd Year	\$63,000	\$69,000 as specified in the proposal

**APPENDIX C.3
COMMENTS ON PROPOSALS RANKED PRIORITY I BY THE
SUBJECT AREA PANELS AND CONSIDERED BY THE FINAL PANEL
BUT NOT RECOMMENDED FOR FUNDING**

Note: These proposals are not listed in rank order of merit.

Proposal 002B

TITLE: *Ethanol Production from Energy cane for Process Integration at a Louisiana Sugar Mill*

INSTITUTION: Louisiana State University-Agricultural Center

PRINCIPAL INVESTIGATORS: Giovanna A. DeQueiroz, Ph.D.; Michael Salassi, Ph.D.;
Melati A. Tessier, BS.

COMMENTS: The US sugar industry generates \$21.1 billion in positive economic activity and creates almost 72,000 jobs. The sugar industry in Louisiana is the second largest domestic producer after Florida, and ranks third among all the agricultural industries in the State. It produces about 1.5 million tons of raw sugar per year, valued at \$640 million. The sugar industry, however, has been faced with increases in processing costs and economic pressures of lower sugar prices. Much research has been done to optimize the sugar process and reduce costs of production to remain economically viable. The goal of the project is to evaluate the production and process economics of ethanol from two energy cane varieties developed by LSU AgCenter in collaboration with Sugar Research Station, United States Department of Agriculture, Agricultural Research Service, Sugarcane Research Unit and the American Sugar Cane League using ASI's ethanol process technology with the support of Louisiana sugar mills for the front-end processing. The objectives of this study include process technology optimization to reduce the cost of biomass pretreatment, identification and removal of intrinsic limitations during ethanol production, process mass and energy balance determination and evaluation of economic impacts for the production of ethanol from cellulose.

This is an interesting proposal which suggests the integration of biomass conversion processing of bagasse and other byproducts of sugar production at the sugar mill level. Although the economic impact appears significant, many federal/state regulations are not well described. To some extent the proposal is placing a band-aid on a serious wound, since sugar production in the US is economical only with government price supports and mills are inefficient by international standards. To just lay the groundwork for upgrading sugar refineries seems minimal; however, the performance goal must include a means to measure the merit of the effort, not just complete the work. The travel and supply budget appears inflated and should be modified.

Appendix C.3 (continued)

Proposal 021B

TITLE: *Design, Synthesis, Characterization, and Testing of Novel Dual Acting HIV/AIDS*

INSTITUTION: Louisiana State University Health Sciences Center – New Orleans

PRINCIPAL INVESTIGATORS: Ronald B. Luftig, Ph.D.; Qui Zhong; MD.;
Navzer D. Sachinvala, Ph.D.; Saymal Raychauduri, Ph.D.

COMMENTS: This year the Nobel Prize in Medicine was awarded to two French investigators who isolated HIV as the causative agent of AIDS; however, after 25 years and over 40 million deaths due to AIDS, there is still no vaccine to protect the un-afflicted public, and no medicinal-agent to cure AIDS. For 12-years, HIV protease inhibitors (PIs) have been used in highly active antiretroviral therapy (HAART) to manage AIDS and HIV infections. Problems remain, however. The efforts are important for Louisiana because New Orleans and Baton Rouge rank among the top 25 US cities reporting AIDS cases. Many patients are impoverished; and restoring worker health, morale, and quality of life with efficient therapeutics affords positive socioeconomic impact. Furthermore, HIV is associated with several cancers such as B-cell and non-Hodgkin's lymphomas, and Kaposi Sarcoma (BCL, NHL, and KS), and therapies for them are also urgently needed. The goal of this project is to synthesize non-toxic analogs of cerulenin to use with the new generation of protease inhibitors.

The proposal has a sound premise and success of the research would have a high probability of impacting the treatment of AIDS. While the study has high translational potential, it is weakened by the lack of convincing preliminary data and questions on the evaluation of drugs. Several questions relating to the multifunctional reagents and potential problems of steric hindrance exist. The synthetic steps are presented in detail; however, there are no details on how and in what combination these drugs are to be evaluated, seemingly the most critical section of the proposal. There is not a great deal of economic benefit to Louisiana but the social impact could be large. The supply budget appears excessive, is not well justified, and includes items which are more likely equipment. The consultant is essential for this project and details of the arrangement between he and the principal investigator are necessary. The proposal failed to include a time-line for the research and the proposed studies did not seem to justify a third year of funding. The lack of graduate student involvement weakened this project considerably.

Appendix C.3 (continued)

Proposal 027BTITLE: *Production of Biofuels from Algae*

INSTITUTION: University Louisiana at Lafayette

PRINCIPAL INVESTIGATORS: Rakesh K. Bajpai, Ph.D.; Mark E. Zappi, Ph.D.

COMMENTS: Lipids are increasingly being used as renewable sources of transportation fuels. Unfortunately, the surface area productivity of the agricultural crops is too low for them to be a viable source of lipids to meet transportation needs of the USA. Several species of algae are known to produce significant quantities of neutral lipids that can potentially meet the challenge. Still, several scientific and engineering knowledge gaps must be addressed before algae may be utilized for the fuel production. These include (a) growth rate; (b) lipid content; (c) nutritional requirements; (d) processing conditions; (e) transfer rates and efficiencies of utilization carbon dioxide and; (f) light penetration and efficiency of light utilization for the different algal species capable of producing significant quantities of lipids. Beyond these knowledge gaps, some of the critical issues in commercial exploitation of this technology are reactors for cultivation of algae, competition with wild/native lipid species in open reactor systems, delivery of light to cells present at any significant depth in the bioreactors, and efficient recovery of desirable lipids from harvested algae.

Although the research is innovative, the proposal lacked details (no time-line provided), and many critical elements such as product harvest and drying were ignored. Many cultivation and growth variables were mentioned in the tasks such as measuring light algae characterization, light frequency, fouling surfaces etc., but questions relating to scale-up of closed bioreactors, which are critical to successful commercialization, were not addressed in any detail. It is assumed that this data was included in the mathematical model (regression), but this should not have to be assumed. The plan for technology transfer was insufficient, and the industry partners should have provided more assistance.

Appendix C.3 (continued)

Proposal 030B

TITLE: *Collaborative Framework for National Resiliency through Public Private Partnerships in Homeland Security and Emergency Management*

INSTITUTION: University of Louisiana at Lafayette

PRINCIPAL INVESTIGATORS: Ramesh Kolluru, Ph.D.; Mark Smith, Ph.D.; Geoffrey Stewart, Ph.D.; Shannon Strother, M.P.H.

COMMENTS: Since 2001, the USA, at every level, has attempted to improve its capacity in emergency management. Many partners in both private and public sectors have identified and developed their specific contingency and response plans. However, collaboration between the public and private sectors remains limited, at best. Private industry owns 85% of Critical Infrastructure and Key Resources (CI/KR) in the USA and 98% of the USA supply chain. These assets and plans do not reflect the public emergency management structure, nor do these private sector plans draw upon the strengths and systems of the public sector. The National Institute Management Systems Advance Technologies (NIMSAT) Institute argues that both the public and private communities are equal stakeholders in Homeland Security and Emergency Management (HSEM). The University of Louisiana at Lafayette NIMSAT institute seeks to enhance national security and resiliency through enhanced public-private partnerships by defining a “best practice” based framework supported by research, software tools and training. The project proposes to research and develop commercial software modules and training simulations that will be disseminated nationally to business and government agencies through seminars, workshops and web-based training, in a “joint-venture” with James Lee Witt, who was the FEMA director under President Clinton.

This research is in an area with considerable potential interest. The proposal would fund the development of commercial software and training material for national distribution. The deliverables (which seem unlikely to have much of an impact) are described in general terms with no description of how they will be implemented. The proposal lacks specificity. The budget requests (4) computers and 50,000 cash in year one and year two for a subcontract to yet another group (BENS-Business Executives for National Security) were not well justified. The multiple investigators for this project seem to have reasonable but overlapping backgrounds. The private sector support, although all in-kind, appears to be significantly exaggerated.

Appendix C.3 (continued)

Proposal 031BTITLE: *An Integrated Approach to the Prediction of Gene Function*

INSTITUTION: University of Louisiana at Lafayette

PRINCIPAL INVESTIGATORS: Rasiah (Raja) Loganantharaj, Ph.D.

COMMENTS: Experimentally determining or validating a functional annotation of a gene is expensive and time consuming. As the number of uncharacterized genes and proteins is increasing, the need to automatically annotate them has become greater than ever. Often researchers are left with sets of uncharacterized genes after clustering them with similar expression profiles. The proposed research seek to refine and improve functional annotation by integrating heterogeneous information, including protein to protein interaction, binding sites, co-expression data, pathway activation, homolog similarity, phylogenetic profiles, and structural domain information. In the absence of curated data on binding sites or structure, the research plan will complement them with derived information such as putative binding sites or predicted secondary structures.

Software development for gene function characterization is needed in the medical community. The proposed work would attempt to link multiple data sources to accomplish this task. The computational portion of this research appears to assemble a number of potential processes for machine learning, but little or no details were given regarding how or why these processes are chosen. Additionally, this proposal could have benefited from further review by a computer scientist. A user interface is suggested, but should have been given a lower priority since this would be the last thing the researchers would be conducting. The funding phase for software development would have been more appropriate to resolve the issue of user interface. It is hard to envision any near term economic benefit for LA from this research.

APPENDIX C.4

**SUMMARIES OF MERITORIOUS PROPOSALS
NOT RECOMMENDED FOR FUNDING AT THIS TIME
(PRIORITY TWO)**

Proposal 007B

TITLE: *Wood/Natural Fiber Plastic Blends as Lost Circulation Control Material in Oil Drilling Industry*

INSTITUTION: Louisiana State University – Agricultural Center
PRINCIPAL INVESTIGATORS: Qinglin Wu, Ph.D.

COMMENTS: During the drilling of wells for oil, gas, and other materials, a drilling fluid is generally circulated through the well bore to the drill bit. The drilling fluid lubricates and cools the drill bits and removal cuttings from the drill bits. A common problem during drilling is lost circulation of the drilling fluid, which occurs when the drill bit encounters highly permeable or fractured formation during drilling. It is estimated that lost circulation costs the industry about \$800 million per year, while the lost circulation products could represent as much as \$200 million. Lost circulation has also led to failures to secure production test and samples; and plugging the production zone has led to decreased productivity. Many lost circulation materials consisting of varying combinations of flakes, fibers, and particles have been used as part of the drilling fluid to cure lost circulations. A typical lost circulation composition consists of various particle types and size distributions to bridge the fracture formations of various sizes.

This is a very well written proposal, but it unfortunately failed to explain why a new product is needed and whether the product will have a significant economic advantage over currently used lost circulation materials (LCMs). This would depend on the properties of the composite materials and the final cost. Additionally, it appears that this is a project of synergistic interest—joining an oil well supply company, a wood source company, and a drilling fluid and supply company. The research testing procedures are detailed, and the principal investigator has an excellent background with significant industrial support (cash and in-kind). The budget appears appropriate but the need for the third year of project support was not demonstrated.

Proposal 013B

TITLE: *The Use of Warm Mix Asphalt Technology for Sustainable Development of Infrastructures*

INSTITUTION: Louisiana State University – Baton Rouge

PRINCIPAL INVESTIGATORS: Louay Mohammad, Ph.D.; Munir Nazzal, Ph.D.;
Mostafa Elseifi, Ph.D.; Marwa Hassan, Ph.D.

COMMENTS: Warm-mix asphalt (WMA) has received considerable attention in recent years to reduce energy consumption and pollutant emissions during hot-mix asphalt (HMA) production and placement. However, many concerns and questions are still unanswered regarding, the performance, environmental, and economic benefits of WMA. With respect to performance there is greater potential for moisture susceptibility due to lower mixing and compaction temperature. In addition, the fatigue and rutting performance of these mixes is still being evaluated. The primary goal of this project is to quantify the performance, environmental, and economic benefits of WMA technology and to develop a framework for design, construction and implementation.

Much work has been done in Europe and hence the proposed research is somewhat repetitive. It is also noted that European aging studies are limited, suggesting the need for accelerated aging studies and that repetition of prior studies using local additives could be of significance. Reduced temperature asphalt production has many potential advantages, including reduced energy utilization, reduced emission levels and the potential to increase use of reclaimed pavement in the mix. Nevertheless, the research will require laboratory and field testing, as well as a life-cycle cost analysis done as a final component of the proposed project. Key questions still remain about field performance and optimal viscosity reducing additives (or devices) for use in Louisiana. Furthermore where are the experiments to be conducted? Synchrotron radiation is not free. The budget is not realistic in this respect and the true cost must be stated. The performance metrics are lacking. Social and economic benefits were not substantiated.

Appendix C.4 (continued)

Proposal 020B

TITLE: *LSU Brain and Behavior Research Program - Treatment Program in Developmental Stuttering*

INSTITUTION: Louisiana State University Health Sciences Center – New Orleans

PRINCIPAL INVESTIGATORS: Anne L. Foundas, M.D.; Jeffrey Mock, Ph.D.; Tracy Knaus, Ph.D.

COMMENTS: Developmental stuttering is the most common developmental speech disorder, with estimates that over 1.5 million Americans, including 4% of children and 1% percent of adults, have this disorder. Stuttering is a major source of disability and suffering, but there is relatively little known about biological susceptibility and risk factors. There are still very few behavioral or drug treatments that effectively reduce stuttering in children and adults. One such treatment is the use of altered-auditory feedback (AAF). Although it is well established that AAF enhances fluency in some individuals who stutter, there is controversy regarding the factors that may contribute to enhanced fluency with this treatment.

The proposed research would examine the mechanism of a hearing-aid like device (SpeechEasy) designed to treat stuttering in children and adults using altered auditory feedback (AAF). Some stutterers seem to have an anomaly in the auditory temporal cortex and such individuals respond to the altered auditory feedback produced by the device. The overall goal is to correlate response to the SpeechEasy device with specific behavioral/cognitive or MRI-based structural variation in brain anatomy in stutterers. The proposal is very well written, although economic issues central to the ITRS program are absent—a major flaw in an otherwise interesting proposal. This proposal would certainly be competitive for Federal SBIR/STTR funding by the National Institute of Health (NIH) or, with minor revisions, the National Science Foundation (NSF).

Appendix C.4 (continued)

Proposal 026BTITLE: *Bubble Nucleation and Droplet Coalescence in Lubricants*

INSTITUTION: Tulane University

PRINCIPAL INVESTIGATOR: Kyriakos Papadopoulos, Ph.D.

COMMENTS: Every automobile owner has some experience with the use of engine oil lubricants. In fact, automobile lubricants involve not only engine oils but also more complex designed lubricants such as automatic transmission fluids (ATF). Besides cars, lubricants are key to the operation of every engine imaginable. Although it may not be common knowledge, Louisiana is a major center in the lubricant business. Competition is keen among companies to improve their lubricants formulations so that they will last longer, make the engines perform better and help them have a longer life and improve their efficiency. At the same time, the advent of new kinds of engines, e.g., hybrid automobiles, alternative fuels, new energy technologies, will further necessitate new types of lubricants since the automobile mechanical system could vary greatly, thus varying the specific requirements for the lubricants.

The principal investigator proposes to use sophisticated capillary video microscopy to study foaming/defoaming and emulsification/demulsification of lubricants. The proposal included interesting preliminary results that have been expanded since the proposal's last submission. The budget is reasonable and well justified and the principal investigator is well qualified to carryout the proposed research. Nevertheless, the proposed research is basic and it is difficult to determine if it will result in a better lubricant formulation. The economic impact to Louisiana is not clear and hard to quantify. However, the importance of chemical companies to the Louisiana economy would improve the potential impact of the research.

APPENDIX C.5**GENERAL STATEMENT ON PROPOSALS RANKED
PRIORITY III BY THE FINAL PANEL**

Individual commentaries on proposals ranked Priority III by the final panel are not included in this report. Proposals so ranked were not recommended for funding for at least two of the following reasons (not listed in order of importance):

- Insufficient or inappropriate industrial matching funds were pledged and/or external support documented in the proposal budget was not substantiated by required letters of industrial support
- The industrial partner(s) role in the research collaboration was not provided and/or detailed in the proposal
- Proposals did not have clear objectives and/or research plans lacked scientific rigor or completeness
- The background of a principal investigator was inconsistent with the proposed research and/or the principal investigator had an unusually poor publication record in the proposed area of research
- The proposal showed little or no potential for contributing to the near-term development and diversification of Louisiana's economy
- The proposal did not contain evidence of future commercialization, or it was not clear what economic benefit would be gained from the research
- Budgets were excessive, inadequately justified, or inconsistent with provided budget justifications
- The need for consultants and/or subcontracts was not adequately justified
- Equipment requests were excessive and inappropriate for the research proposed

APPENDIX D

LIST OF SUBJECT AREA REVIEWERS WHO PARTICIPATED IN PHASE I & II OF THE REVIEW PROCESS

Agriculture, Aquaculture, and Animal Science

Dr. Duane L. Johnson, Chair

Great Plains Oil and Exploration Company
Camelina Company

Dr. Paul Raymer

Department of Crop and Soil Sciences
University of Georgia

Biotechnology and Health Care

Dr. Radu Marches, Chair

Cancer Immunobiology Center
University of Texas Southwestern Medical Center at Dallas

Dr. Leo Herbette

President, Exploria

Chemical Materials and Petroleum Engineering

Dr. Russell D. Ostermann, Chair

Department of Chemical & Petroleum Engineering
University of Kansas

Dr. Roger A. Korus

Department of Chemical Engineering
University of Idaho

Computer and Information Sciences

Dr. John Usher, Chair

Professor, Department of Industrial Engineering
Mississippi State University

Dr. Behrooz A. Shirazi

Director, School of Electrical & Computer Science
Washington State University

Appendix D (continued)

Mechanical and Materials Engineering

Dr. John Berry, Chair

E. P. Coleman Professor, Department of Mechanical Engineering
Mississippi State University

Dr. Michael Paul Gaus

Chairman, Technology Frontiers

Environmental Science & Technology, and Urban Design

Dr. Sam Feagley, Chair

Professor and State Soil Environmental Specialist
Department of Soil and Crop Science
Texas A & M University

Dr. Steve Stadelman

Environmental Operations Department
Novozymes North America, Incorporated

APPENDIX E

**SUMMARY OF PROPOSALS SUBMITTED TO THE
INDUSTRIAL TIES RESEARCH SUBPROGRAM (ITRS)
FY 2008-09**

**Summary of Proposals Submitted to the
Industrial Ties Research Subprogram (ITRS)
for the FY 2008-2009 Review Cycle**

Proposal #	Title	Institution/Department	Principal Investigator	Duration (Yrs)	BoRSF Money Requested
001 B-09/SCI	Production of Ethanol, Animal Feed and Fertilizer from Sweet Sorghum and Energy Cane	Louisiana State University and A&M College-Agricultural Center/Audubon Sugar Institute	Chang-Ho Chung; Donal F. Day		
New Request			Contain Confidential/Proprietary Information? No	1	\$80,000
				2	\$80,000
TOTAL					\$160,000
002 B-09/SCI	Ethanol Production from Energy Cane for Process Integration at a Louisiana Sugar Mill	Louisiana State University and A&M College-Agricultural Center/Audubon Sugar Institute	Giovanna A. DeQueiroz; Michael Salassi; Melati A. Tessier		
New Request			Contain Confidential/Proprietary Information? Yes	1	\$150,000
				2	\$100,000
TOTAL					\$250,000
003 B-09/SCI	Development of Healthy Legume-Based Child and Adolescent Foods	Louisiana State University and A&M College-Agricultural Center/ Department of Food Science	Joan M. King; John Finley; Fatemeh Malekian; Anne Parr; Marlene Janes; Subramanian Sathivel		
New Request			Contain Confidential/Proprietary Information? No	1	\$102,963
				2	\$99,957
				3	\$87,134
TOTAL					\$290,054
004 B-09/SCI	Production of Hydrogen Fuel in Microalgae	Louisiana State University and A&M College-Agricultural Center/ Biotechnology Laboratory	Svetlana Oard; Chandra Theegala; Mike Mailander; Giovanna DeQueiroz		
New Request			Contain Confidential/Proprietary Information? No	1	\$100,170
				2	\$99,170
				3	\$99,670
TOTAL					\$299,010
005 B-09/SCI	Development of Safe and Ready to Eat Frozen Oyster Products	Louisiana State University and A&M College-Agricultural Center/ Department of Food Science	Subramaniam Sathivel; Beilei Ge; John Finley; Joan King		
New Request			Contain Confidential/Proprietary Information? No	1	\$98,250
				2	\$98,350
				3	\$99,350
TOTAL					\$295,950
006 B-09/SCI	Improving Nutrient Uptake Efficiency of Major Crops in Louisiana Using Humic Acid-Based Agricultural Additives	Louisiana State University and A&M College-Agricultural Center/School of Plant, Environmental, and Soil Sciences	Brenda S. Tubafía; Jim Wang		
New Request			Contain Confidential/Proprietary Information? No	1	\$85,250
				2	\$55,000
				3	\$55,000
TOTAL					\$195,250

Proposal #	Title	Institution/Department	Principal Investigator	Duration (Yrs)	BoRSF Money Requested
007	B-09/SCI	Wood/Natural Fiber Plastic Blends as Lost Circulation Control Material in Oil Drilling Industry	Louisiana State University and A&M College-Agricultural Center/School of Renewable Natural Resources	Qinglin Wu	
	New Request			Contain Confidential/Proprietary Information? No	
				1	\$72,123
				2	\$72,123
				3	\$72,123
				TOTAL	\$216,369
008	B-09/SCI	Advanced Characterization and Modeling of DUV and EUV Photoresists	Louisiana State University and A&M College-Baton Rouge/Department of Chemical Engineering	John C. Flake; Francisco R. Hung; José Romagnoli	
	New Request			Contain Confidential/Proprietary Information? No	
				1	\$74,880
				2	\$72,241
				3	\$74,738
				TOTAL	\$221,859
009	B-09/SCI	Evaluation of the Thermal Performance and Cost Effectiveness of Radiant Barrier Thermal Insulation Materials in Residential Construction	Louisiana State University and A&M College-Baton Rouge/Department of Construction Management and Industrial Engineering	Marwa Hassan	
	New Request			Contain Confidential/Proprietary Information? No	
				1	\$35,044
				2	\$32,959
				TOTAL	\$68,003
010	B-09/SCI	Optimization of Liner Selection for Composite Tanks and Vessels	Louisiana State University and A&M College-Baton Rouge/Department of Mechanical Engineering	Jack E. Helms; Su-Seng Pang; Guoqiang Li; M.A. Wahab	
	New Request			Contain Confidential/Proprietary Information? No	
				1	\$75,000
				2	\$70,000
				3	\$65,000
				TOTAL	\$210,000
011	B-09/SCI	Investigation of Yeast-Based Mammalian-Analogs for the Evaluation of Chemical Toxicity and Mutagenicity	Louisiana State University and A&M College-Baton Rouge/Department of Chemical Engineering	James Henry; Mike Benton	
	New Request			Contain Confidential/Proprietary Information? No	
				1	\$68,166
				2	\$69,880
				3	\$71,691
				TOTAL	\$209,737
012	B-09/SCI	Discovery of Operational Knowledge from Process Data for Maximum Effectiveness	Louisiana State University and A&M College-Baton Rouge/Department of Construction Management and Industrial Engineering	T. Warren Liao; E. Triantaphyllou	
	New Request			Contain Confidential/Proprietary Information? No	
				1	\$75,888
				2	\$67,629
				3	\$53,573
				TOTAL	\$197,090

Proposal #	Title	Institution/Department	Principal Investigator	Duration (Yrs)	BoRSF Money Requested
013 B-09/SCI	The Use of Warm Mix Asphalt Technology for Sustainable Development of Infrastructures	Louisiana State University and A&M College-Baton Rouge/Department of Civil and Environmental Engineering	Louay Mohammad; Munir Nazzal; Mostafa Elseifi; Marwa Hassan		
New Request			Contain Confidential/Proprietary Information? No	1	\$69,486
				2	\$61,604
				3	\$51,255
			TOTAL		\$182,345
014 B-09/SCI	Development of LeanSafe: A Practical Method and Implementation Tool to Assess and Improve Plant Operating Efficiency and Safety	Louisiana State University and A&M College-Baton Rouge/Department of Construction Management and Industrial Engineering; Southeastern Louisiana University	Isabelina Nahmens; Laura Ikuma		
New Request			Contain Confidential/Proprietary Information? No	1	\$97,195
				2	\$80,857
				3	\$54,887
			TOTAL		\$232,939
015 B-09/SCI	Intelligent Multi-Agent Framework for Supervision of Manufacturing Processes	Louisiana State University and A&M College-Baton Rouge/Department of Chemical Engineering	Jose A. Romagnoli		
New Request			Contain Confidential/Proprietary Information? No	1	\$76,373
				2	\$58,595
				3	\$58,819
			TOTAL		\$193,787
016 B-09/SCI	Stress at Defects: A Combined Atomistic and Continuum Approach	Louisiana State University and A&M College-Baton Rouge/Department of Mechanical Engineering	Glenn Sinclair; Dorel Moldovan		
New Request			Contain Confidential/Proprietary Information? No	1	\$46,415
				2	\$43,585
			TOTAL		\$90,000
017 B-09/SCI	Cognitive Radio and MAC Layer Enhancements for Wireless Communication Networks	Louisiana State University and A&M College-Baton Rouge/Department of Electrical and Computer Engineering	Shuangqing Wei; Rajgopal Kannan		
New Request			Contain Confidential/Proprietary Information? No	1	\$91,141
				2	\$87,270
				3	\$82,396
			TOTAL		\$260,807
018 B-09/SCI	Development of Geopolymer-Based Smart Bonding Materials for Distributed Optic Fiber Sensor Applications to Infrastructures	Louisiana State University and A&M College-Baton Rouge/Department of Civil and Environmental Engineering	Guoping (Gregg) Zhang; Steve C.S. Cai		
New Request			Contain Confidential/Proprietary Information? No	1	\$93,583
				2	\$79,190
				3	\$80,879
			TOTAL		\$253,652
019 B-09/SCI	Modeling and Robust Control of Color Printer Engines	Louisiana State University and A&M College-Baton Rouge/Department of Electrical and Computer Engineering	Kemin Zhou		
New Request			Contain Confidential/Proprietary Information? No	1	\$64,814
				2	\$64,616
				3	\$64,419
			TOTAL		\$193,849

Proposal #	Title	Institution/Department	Principal Investigator	Duration (Yrs)	BoRSF Money Requested	
020	B-09/SCI LSU Brain and Behavior Research Program - Treatment Program in Developmental Stuttering New Request	Louisiana State University Health Sciences Center-New Orleans/ Department of Neurology	Anne L. Foundas; Jeffrey Mock; Tracy Knaus	Contain Confidential/Proprietary Information? No	1	\$119,079
					2	\$99,720
					3	\$79,926
				TOTAL		\$298,725
021	B-09/SCI Design, Synthesis, Characterization, and Testing of Novel Dual Acting HIV/AIDS New Request	Louisiana State University Health Sciences Center-New Orleans/ Department of Microbiology	Ronald B. Luftig; Qiu Zhong; Navzer D. Sachinvala; Saymal Raychaudhuri	Contain Confidential/Proprietary Information? No	1	\$65,000
					2	\$65,000
					3	\$65,000
				TOTAL		\$195,000
022	B-09/SCI Development of New Vascular-Targeted Mitocans as Anti-Cancer Therapeutics New Request	Louisiana State University and A&M College-Shreveport/Department of Chemistry and Physics	Brian A. Salvatore; Elahe Mahdavian	Contain Confidential/Proprietary Information? No	1	\$99,064
					2	\$82,493
					3	\$82,643
				TOTAL		\$264,200
023	B-09/SCI Sensory System for Critical Infrastructure: Defect Recognition, Visualization and Failure Prediction New Request	Louisiana Tech University/Department of Civil Engineering	Erez N. Allouche; Neven Simicevic; Klaus Grimm	Contain Confidential/Proprietary Information? No	1	\$76,221
					2	\$51,548
					3	\$51,548
				TOTAL		\$179,317
024	B-09/SCI Clay Nanotubes for Controlled Release of Corrosion Inhibitors New Request	Louisiana Tech University, Institute for Micromanufacturing, Department of Engineering	Yuri Lvov	Contain Confidential/Proprietary Information? No	1	\$65,000
					2	\$65,000
					3	\$65,000
				TOTAL		\$195,000
025	B-09/SCI Optical Instrument for the Real-Time Estimation of In Vivo Nanoparticle Concentration New Request	Louisiana Tech University/Department of Biomedical Engineering	D. Patrick O'Neal	Contain Confidential/Proprietary Information? No	1	\$61,205
					2	\$60,096
					3	\$58,651
				TOTAL		\$179,952
026	B-09/SCI Bubble Nucleation and Droplet Coalescence in Lubricants New Request	Tulane University/Department of Chemical and Biomolecular Engineering	Kyriakos Papadopoulos	Contain Confidential/Proprietary Information? No	1	\$58,455
					2	\$52,765
					3	\$50,985
				TOTAL		\$162,205

Proposal #	Title	Institution/Department	Principal Investigator	Duration (Yrs)	BoRSF Money Requested
027 B-09/SCI	Production of Biofuels from Algae	University of Louisiana at Lafayette/Department of Chemical Engineering	Rakesh K. Bajpai; Mark E. Zappi		
New Request			Contain Confidential/Proprietary Information? No	1	\$73,907
				2	\$71,415
				3	\$72,735
				TOTAL	\$218,057
028 B-09/SCI	Development of Safe Collaboration Among Humans, Robots and Other Similar Automation	University of Louisiana at Lafayette/Department of Mechanical Engineering	Suren N. Dwivedi; Terrance L. Chambers; Ashok Kumar; William Mueller; William Simon		
New Request			Contain Confidential/Proprietary Information? No	1	\$79,716
				2	\$80,123
				3	\$82,850
				TOTAL	\$242,689
029 B-09/SCI	A Feasibility Study of CO ₂ Sequestration for Enhanced Oil Recovery Purposes in Louisiana	University of Louisiana at Lafayette/Department of Petroleum Engineering	Ali Ghalambor; Fathi H. Boukadi		
New Request			Contain Confidential/Proprietary Information? No	1	\$76,909
				2	\$59,783
				3	\$61,424
				TOTAL	\$198,116
030 B-09/ NON-SCI	Collaborative Framework for National Resiliency through Public-Private Partnerships in Homeland Security and Emergency Management	University of Louisiana at Lafayette/National Incident Management Systems and Advanced Technologies Institute	Ramesh Kolluru; Mark Smith; Geoffrey Stewart; Shannon Strother		
New Request			Contain Confidential/Proprietary Information? No	1	\$145,674
				2	\$99,769
				3	\$99,148
				TOTAL	\$344,591
031 B-09/SCI	An Integrated Approach to the Prediction of Gene Function	University of Louisiana at Lafayette/Center for Advanced Computer Studies	Rasiah (Raja) Loganantharaj		
New Request			Contain Confidential/Proprietary Information? No	1	\$79,729
				2	\$74,895
				3	\$74,138
				TOTAL	\$228,762
032 B-09/SCI	Ultrafine-Grained Advanced High Strength Microalloyed Steels Resistant to Stress-Induced Cracking	University of Louisiana at Lafayette/Center for Structural and Functional Materials and Chemical Engineering	Devesh K. Misra		
New Request			Contain Confidential/Proprietary Information? No	1	\$76,574
				2	\$77,786
				3	\$79,058
				TOTAL	\$233,418
033 B-09/SCI	Hypotheses Discovery from Literature, Sequence and other Heterogeneous Databases for NF- κ B Pathway	University of Louisiana at Lafayette/The Center for Advanced Computer Studies	Vijay Raghavan; Wu Xu		
New Request			Contain Confidential/Proprietary Information? No	1	\$53,313
				2	\$54,334
				3	\$55,398
				TOTAL	\$163,045

Proposal #	Title	Institution/Department	Principal Investigator	Duration (Yrs)	BoRSF Money Requested
034	B-09/SCI	Metal-Catalyzed Group Transfer Reactions	University of Louisiana at Lafayette/Department of Chemistry	Radhey Srivastava	
	New Request		Contain Confidential/Proprietary Information? No	1	\$110,739
				2	\$99,161
				3	\$85,415
				TOTAL	\$295,315
035	B-09/SCI	Multiple Model Fault Detection and Diagnosis with Application to Large-Scale Automated HVAC Systems	University of New Orleans/Department of Electrical Engineering	X. Rong Li; Vesselin P. Jilkov	
	New Request		Contain Confidential/Proprietary Information? No	1	\$65,000
				2	\$65,238
				3	\$65,490
				TOTAL	\$195,728

**SUMMARY OF PROPOSALS SUBMITTED TO THE
INDUSTRIAL TIES RESEARCH SUBPROGRAM (ITRS) FOR FY 2008-2009 REVIEW CYCLE**

TOTAL NUMBER OF PROPOSALS SUBMITTED	TOTAL FIRST-YEAR FUNDS REQUESTED	TOTAL FUNDS REQUESTED	TOTAL FIRST-YEAR FUNDS AVAILABLE
35	\$2,862,326	\$7,614,821	