NOMINATION OF THE
California State University San Bernardino
Inland Empire Center for Entrepreneurship (IECE)
Integrated Technology Transfer Network Program (ITTN)

For the 2010 USASBE Entrepreneurship Education National Award in

Outstanding Specialty Entrepreneurship Program

Submitted by:

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Executive Summary

Nominee: Inland Empire Center for Entrepreneurship
California State University San Bernardino
Integrated Technology Transfer Network program (ITTN)

Purpose of the program: Scientific knowledge is widely used to identify and develop promising technologies but commercializing new technologies and building sustainable businesses requires a different approach and skill set. Developed in collaboration with the US Army Research Laboratory (ARL), the Integrated Technology Transfer Network (ITTN) provides top minority science students from across the nation with an advanced graduate level academic program that helps them learn how to move from “mind to market” and prepares them to become technology innovators and entrepreneurial leaders of the future.

Merging the students existing science expertise with innovative entrepreneurial approaches, ITTN is an intensive year-long program offered to a select group of up to ten (10) student “Fellows” each year. Throughout the school year and during a special summer residency at the ARL, students work on technology transfer and commercialization projects, interact with practicing entrepreneurs, investors and research mentors and participate in challenging seminar coursework on technology entrepreneurship. Students completing the program earn course credit toward an MBA in Entrepreneurship and are awarded a graduate Certificate in Technology Entrepreneurship. More importantly, students discover their entrepreneurial potential and are transformed into “entrepreneurial scientists” positioned to take their new skills and knowledge and turn promising research and technologies into successful new ventures.

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Program objectives: The ITTN program exposes students already well grounded in the Science, Technology, Engineering and Mathematics (STEM) disciplines to the entrepreneurial process through coursework, experiential learning, mentoring and an intensive summer residency at the ARL, helping them gain a greater understanding of:

1) What constitutes an entrepreneur in terms of behaviors, characteristics and mindset.
2) The difference between ideas & opportunities and where entrepreneurial opportunities are born.
3) The critical skills and tools needed to successfully assess, shape and take advantage of new venture opportunities, particularly those emanating from basic research and technology.
4) The key factors of success for new venture creation.
5) Their personal entrepreneurial capacity through a deliberate process of self-discovery and reflection.
6) The opportunities and challenges for creative, entrepreneurial behavior in the field of scientific research and in the defense community.
7) How to apply their new entrepreneurship skill sets to important, challenging technology ventures with high impact.
8) How to move promising technologies from “mind to market.”

Population served: Students participating in the program are recruited and selected from Historically Black Colleges and Universities (HBCU) in the United States. Students must possess, at a minimum, an undergraduate degree in Science, Technology, Engineering and Mathematics (STEM) disciplines (with a preference toward Master’s or Ph.D. level achievement) and a strong interest and desire to pursue a future path as entrepreneur or intrapreneurial change agent within an existing organization such as the ARL. The students work in a cohort group with a maximum size of 15 students (typical enrollment is 10 students).

Program description: Now entering its fifth year with 40 graduates, the ITTN program is an intensive educational and experiential learning program that trains minority students with science, technology, engineering, and math backgrounds to identify and facilitate the commercialization of emerging technologies that result from their own research interests or that are currently being developed within the ARL. Students learn entrepreneurial skills and approaches to effectively bridge the gap that often exists between scientific discovery/technology development and the launch and growth of standalone entrepreneurial ventures or internal organizational venture and commercialization projects.

Program features: The program consists of three distinct phases:

Phase One – Immersion. The ITTN Fellows are immersed in an intensive 1 week, 40 hour long “pre-course” boot camp on the fundamental principles of business, economics, finance and entrepreneurship. This stage enables the students to begin “learning the language” of business and entrepreneurship and provides them with a solid foundation to begin the introductory coursework on entrepreneurship and technology transfer and commercialization. As the Fellows have noted, this is also called the “drinking from a fire hose” experience!

Phase Two – Discovery: Building the Entrepreneurial Knowledge and Experience Base. During this phase, students begin a nine (9) month series of coursework and experiential learning projects that build an extensive knowledge base and skill-set in entrepreneurship and technology transfer and commercialization, preparing them for the final phase that will require application in a live setting at a selected federal lab, corporation, emerging entrepreneurial venture, or university lab setting. Students proceed through six (6) academic courses and a variety of intensive workshops, such as:

- Academic Courses
  - Commercializing Entrepreneurial Innovation
- New Venture Opportunity Analysis
- Entrepreneurship and New Ventures
- New Venture Resource Requirements
- New Venture Planning and Strategy
- Managing a Growing Business

- Workshops and Seminars
  - Venture Capital Workshop
  - Professional Development & Presentation Skills Workshop
  - Basics of Technology Transfer and Commercialization
  - Small Business Innovation Research (SBIR) Funding and Government Procurement Workshop
  - Business Etiquette Workshop

Courses are taught by our entrepreneurial full-time faculty as well as practicing technology and science entrepreneurs, angel investors, and venture capitalists.

Each course contains experiential learning components and live projects. For example, ITTN Fellows must launch test businesses (live businesses that give them an opportunity to experience entrepreneurship first hand); perform live venture screening projects working collaboratively with the Tech Coast Angels (the largest angel investor group in the US); and execute a Rapid Opportunity Check (ROCK!) and Rapid Action Plan (RAP!) on a new technology venture that emanates from their personal interest or research stream.

Coupled with the coursework in this phase, ITTN Fellows spend each academic quarter engaged as student interns working on experiential projects for a selected federal lab, corporation, entrepreneurial venture or university identified technology commercialization project to perform technology feasibility assessments and develop commercialization plans. In 2008-09, ITTN Fellows worked on projects for the following organizations, each of which has committed to participate in 2009-10 with new commercialization projects: NASA Goddard Space Flight Center, The National Renewable Energy Laboratory (NREL) and Lawrence Berkeley National Laboratory.

Lastly, ITTN Fellows are given the opportunity to attend a wide variety of seminars, conferences and entrepreneurial events (e.g. Tech Coast Angels Deal Review Sessions, Black Enterprise Conference, Harvard Entrepreneurship Conference, Spirit of the Entrepreneur Awards program, Tech Coast Angels Fast Pitch Competition and CSUSB Fast Pitch Competition) that enhance and build upon course learning.

**Phase Three – Launch: Applying the Knowledge and Experience Base.** Upon successfully completing the required elements of phase one and two, passing a comprehensive examination, and the submission of a reflective portfolio (essay, entrepreneurial toolkit and completed commercialization SWOT, market feasibility study, and business plan), ITTN Fellows advance to a 12-week summer technology commercialization internship project hosted by the ARL’s Tactical Information Fusion Branch at the Aberdeen Proving Ground in Maryland (which
focuses on the research areas of knowledge fusion and information sharing). Any students not passing the ARL’s stringent security clearance process are assigned by the ITTN program to work on locally secured commercialization project based at a federal lab, corporation, university or entrepreneurial venture.

This phase of the program is intended to be the “capstone” experience for the Fellows, providing them an opportunity to bring to bear their new knowledge base and experience in entrepreneurship and technology transfer and commercialization as consultants for the ARL and other participating organizations. In this phase, Fellows are expected to be self-motivated, independent workers that will take responsibility to research, execute and complete assigned tasks with minimal supervision.

During the summer residency ITTN Fellows work with senior-level science and technology researchers to seek opportunities and create plans for transitioning promising lab research to Army program offices for operational development, and to explore first-hand a potential career as an Army researcher. Fellows study major ARL programs from a technology transfer perspective and the Army environment that defines available transition paths. They utilize the entrepreneurial skill sets developed in the ITTN educational program to identify specific opportunities, develop technology transfer plans, and design and develop materials to market the technologies to potential Army “customers.” Special focus is on applying technology entrepreneurship skills used in the commercial sector to the Army sector. In addition, ITTN Fellows summarize the basic concepts of entrepreneurship and technology transfer and commercialization from the educational phase of the ITTN program and deliver a series of seminars and workshops for ARL scientists, helping to cultivate and build an internal ARL knowledge and practice base on “intrapreneurship.”

Overall the summer internship program help fellows to understand the challenges of entrepreneurship in a large organization; understand the opportunities and challenges for creative, entrepreneurial behavior in the field of scientific research and in the other science-related communities; gain a better understanding of the challenges related to technology entrepreneurship in the global “real world” of large industry and Government; apply their new entrepreneurship skill sets to important, challenging technology ventures with high impact; and consider their personal motivation for obtaining an advanced degree leading toward a career as a research scientist and the available opportunities within various industries.

Upon successful completion of Phase Three, ITTN Fellows receive a Certificate in Technology Entrepreneurship from CSUSB and are eligible to apply to the MBA in Entrepreneurship program at CSUSB.

Sources of funding: The program currently receives its primary source of funds from the US Army Research Laboratory, Computational and Information Sciences Directorate. The current 2009-10 operating budget for the program is $1,389,600. Funding from ARL over the four-year operation of the program exceeds $5 million. CSUSB and IECE provide tremendous in-kind commitment (facilities, materials, direct cost share) as well as faculty and staff support. The program is currently seeking to expand with additional funding from USDA, NSF, and in a
collaborative program with Morgan State University. Cal State San Bernardino president Dr. Al Karnig has also selected the ITTN program as one of his top strategic funding initiatives over the next three years.

**Program benefits:** In our assessment, the greatest benefit of the program is that it exposes students to a whole “other world” of possibilities as entrepreneurial scientists. To date, nearly every Fellow has described the program as a transformational process that has left them a “changed individual.” From the ARL perspective (as our key partner), they are reaping the value of the technology commercialization plans as well as receiving mentoring and role modeling from the ITTN Fellows during the summer residency, in effect helping to begin an organizational culture shift toward more “thinking out of the box, in the box.” (Mark Thomas, ARL).

In addition, the ITTN program creates a pipeline of talent to provide collaborating agencies (e.g. Berkley Lab, US Department of Agriculture, Army Research Laboratory, and other corporate and governmental entities), effectively giving ITTN Fellows an additional career path and introduction to organizational environments that are conducive to the skill set and knowledge base they acquire in the ITTN program. As such, one measure of success for the ITTN Program will be measured by the extent to which the program is perceived by the partnering agencies, faculty, students and entrepreneurs as being a top resource for achieving technology transfer objectives.

**Program outcomes:** ITTN Fellows graduate with a new set of skills and knowledge (see Appendix for student outcomes/competencies), but also the confidence to pursue the entrepreneurial path, merging science and entrepreneurship effectively to go from “mind to market.” Over 80% of program graduates have ended up in business related positions or careers. Past graduates of the ITTN program have launched technology ventures, taken positions in both university, corporate and government sectors in technology transfer positions, and have continued the pursuit of research and advanced degrees in both science and entrepreneurship. As one recent graduate (now a Tech Transfer Fellow who assists in commercializing faculty technology at Columbia University) noted “This opportunity would not have been possible without ITTN and it will be instrumental in helping me transition from health research to health management and technology.” As another fellow noted “The program changed me and put me on a new path – that of entrepreneurship. Now I have not only the science and technology knowledge but powerful business skills that will help me build a successful venture.”

In addition, up to two (2) Fellows from each cohort are selected through a competitive process to receive a full scholarship at CSUSB to complete their MBA in Entrepreneurship. To date, five Fellows have received this $75,000 scholarship.

While the short-term benefits are clear (new career opportunities, launching of entrepreneurial ventures), the long-term potential of the program is not yet realized. Overall, we believe the long term potential is that the graduates of the ITTN program will serve as role models and mentors in their respective communities, helping to influence an upcoming generation of potential scientists and entrepreneurs.