

Partnership for Broadband Wireless Innovations, Development and Commercialization

Project Summary

The vision of the Partnership is to transform existing one-dimensional collaborations in research, technology, education and commerce, now serving the Broadband Wireless Communications industry in the Delaware Valley region, into a multi-dimensional Integrated Community of Partners pursuing common objectives. The PI is Barry Johnson, Ph.D., Dean of the College of Engineering at Villanova University, the lead institution. The Partnership base, developed by Villanova and active since 1990, will grow into a new structure designed to benefit an entire community of users, not just a few sponsoring companies. The distinguishing feature is the inclusion of the Ben Franklin organization as a principal partner to make technology commercialization and economic development co-equal with the goals of research and education.

The Partnership is designed to create and disseminate new knowledge, to prepare a technologically capable workforce, and to develop the entrepreneurial community and infrastructure for progress in innovations by this knowledge workforce. The Partnership for Broadband Wireless will achieve the goals of: (1) technology development and core research by the University partners, interacting with supporting Federal Laboratories and large corporations; (2) educational diversification through focused enrichment projects with Community College and High School partners, and educational outreach through advanced engineering training programs with industry partners; and (3) applied research and technology commercialization resulting from Ben Franklin's investment initiatives for growth-oriented small and medium companies.

The Partnership's focus is Broadband Wireless Technology, which has and continues to redefine how we live our lives. Within this broad area, there are three key interrelated technologies that are integral to all wireless systems: Smart Antennas, Low-Profile Antennas, and Thermal Management. The intellectual merit of this proposal comes from advances in core research in these areas, and in the formulation and organization of a unique partnership model. Smart antennas will utilize the capability to transmit and receive using multiple antennas to significantly increase the system capacity and meet the demand of high data rates. Low-profile antennas create opportunities for efficient low-cost, low-weight designs for portable wireless devices. Thermal management innovations are needed to handle heat dissipation for the high power density devices in next generation wireless systems. The proposed Partnership model allows immediate and wide applications for the three core research areas within Broadband Wireless technologies, and creates a community utilizing research, technology, education, and commerce in these areas to leverage the resources of the individual partners. The model is based on participation of partners representing academic institutions, private sector, community colleges and high school, National Laboratories, and a State agency.

The broader impacts of the proposed activities occur on three primary fronts; educational diversification, educational outreach, and regional economic development, each having outcomes important to ensuring the long-term sustainability of the Partnership. Performance metrics are established to measure the impact on each front. Education objectives cover curricula assessments and annual engineering education orientation workshops for community college and high school faculty and students, culminating in increased engineering college applications as well as advanced engineering seminars and training sessions for industry partners. Outcomes for regional economic development have targets for technology transfer, investment and commercialization, resulting in growth and job creation/retention by partner companies.