

NANOMAN2-Altix 3700Bx2 Integrated Nanomaterials Characterization and Nanomanipulation System

ABSTRACT

This proposal focuses on acquiring instrumentation for a unique nanomaterials characterization and manipulation capability, the *NANOMAN2-Altix 3700Bx2 Integrated Nanomaterials Characterization and Nanomanipulation System*. This system is composed of two major components: the NanoMan II nanolithography, nanomanipulation, and characterization scanning probe microscope system manufactured by Veeco Metrology and a SGI Altix 3700Bx2 supercomputer for theoretical-based, virtual synthesis computations. These components will be integrated into a facility housed at the ABC* University to realize an entire nanomaterials development cycle - from the synthesis of quantum dots and wires to nanomanipulations, nanolithography, and computationally driven templated synthesis of novel nanoheterostructures with pre-designed opto-electronic and magneto-optical properties that are of special interest to AFRL/AFOSR. When combined with the SQUID-based magnetometer system and other characterization instrumentation in the ABC University, the *NANOMAN2-Altix Integrated System* will also permit a multitude of non-destructive quantitative property techniques to characterize these nanometer length-scale materials and structures. This facility will be available to researchers at XYZ** University in order to improve the quantity of current research collaborations between ABC, XYZ, and AFRL/AFOSR, and to develop new joint projects focusing on the synthesis of advanced nanomaterials for sensor and source applications.

The research training capabilities enabled by the *NANOMAN2-Altix 3700Bx2 Integrated System* will be incorporated into novel educational approaches being developed at ABC and XYZ, and available to a large pool of students and teachers through the ABC-XYZ network. These students will provide a task force to support AFRL/AFOSR/DoD collaborative projects realized by the *NANOMAN2-Altix 3700Bx2 Integrated System*. This early hands-on specialized training and awareness about AFOSR/DoD programs will prepare students to consider and meet challenges of DoD-supported careers.

* The name of the University has been changed to ABC for customer information protection.

** The name of the University has been changed to ABC for customer information protection.