

DOE-EPSCoR Implementation Program

“The Next Generation Solid State Power Conversion Materials “

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Abstract

The project's objective is to take the state of SC's capacity for research, development, design, and implementation of the next generation advanced thermoelectric (TE) materials to a world-class level. The magnitude of the funds involved in this program will be able to build a nationally recognized research center of excellence in the focused area of the next generation TE materials for power conversion and/or refrigeration technologies. World-class facilities and infrastructure to synthesize and characterize new classes of thermoelectric materials will be put into place. Over the past year we have hired a new faculty member, Fivos Drymiotis, who will begin his faculty appointment in June, 2005. His expertise lies in materials synthesis and the development of new classes of materials. We have purchased several major pieces of equipment including a dedicated X-Ray diffraction system, a hot isostatic press system, a high temperature DSC, greatly expanded system of furnaces and a laser flash diffusivity system. A close association and interaction with scientists at Oak Ridge National Laboratory has already been established and that relationship will be greatly expanded with these funds.

Several classes of materials will be investigated with potential for thermoelectric (TE) applications. In addition, each of these classes of materials poses several interesting scientific questions, which we wish to also address in this investigation. Graduate and undergraduate students will be extensively involved in this project, thus gaining significant training and educational opportunities through the interaction with the broad expertise and facilities of a national laboratory such as ORNL. A number of minority and under-represented (female) students will be involved in the project and there is a component involving subcontract and research collaboration with a SC HBCU (SC State University).