Editorial

We are delighted to present you this issue of our electronic journal, www.jstem.org that has been developed by the exceptional efforts of the guest editor, Dr. Steve Watkins. His leadership and enthusiasm for encouraging publication of projects that discuss outreach resources, successful programs, and learning considerations of STEM pre-college programs is commendable.

We thank him and the distinguished authors and reviewers who had made this issue possible. We look forward to your comments on the issue. Please contact us at litee@eng.auburn.edu

P.K. Raju Chetan S. Sankar
Editors-in-Chief

Guest Editorial

A strong workforce in science and engineering and literate citizens in a technological-based society begin with pre-college education. Students must be adequately prepared in science, technology, engineering, and mathematics (STEM) topics. Unfortunately, the performance of K-12 students tends to be poorer in the technical portion of the curriculum than in other topics. Many students lose interest in science and mathematics early in their school years. Some avoid technical electives and careers and develop the unwarranted feeling that STEM topics are too hard and not relevant. Consequently, pre-college outreach that targets high school and middle school students may be too late in the educational process.

This special issue addresses outreach efforts for technical education in the early grades. The needs, environment, and opportunities of elementary education are different than for the higher grades. Engineers, scientists, and other technology professionals can have a valuable role in promoting technical interest and literacy in these early grades. Elementary education teachers can benefit from resources and technical partnerships that assist them in incorporating stimulating examples and content into their science and mathematics instructions. Outreach for elementary education can influence students as they develop a foundation and interest in STEM topics. I thank the authors and reviewers of this special issue for contributing to this important aspect of professional service.

These papers present outreach resources, successful programs, and learning considerations. An invited paper from Kesidou and Koppal describes Project 2061 of the American Association for the Advancement of Science. This education reform initiative promotes scientific literacy through detailed learning goals and recommendations. The next two papers discuss commercial hardware and software tools and the sample instructional applications that relate engineering content to basic concepts. Rodgers and Portsmore from Tufts University describe the ROBOLAB toolset that uses LEGO-mindstorm materials and LabVIEW data acquisition. Perrin illustrates inquiry instruction using products from Vernier Software and Technology. Papers from Kansas State University, Auburn University, and the University of Oklahoma present models for outreach programs. These programs include partnerships among teachers, parents, faculty, and college students. Matson and colleagues developed a *Robot Roadshow*, Rhoads and colleagues sponsored after-school clubs, and Raju and colleagues ran a science summer camp. Finally, Swift and Watkins discuss the environment of elementary education and list available resources.

Most professional societies have outreach programs and resources and their local organizations often need STEM professionals for local activities. Interested STEM professionals can use the material in this issue to become part of existing activities or to start their own activities. I hope that these papers will be models and inspiration for effective pre-college activities.

Steve E. Watkins, Guest Editor
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Our thanks to the following reviewers who selected the articles that are presented in this issue.:

Lori Baker
Susan Eudaly
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Theresa Swift
Joyce Taber
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