

BLENDING SCIENCE AND TECHNOLOGY IN THE DEVELOPMENT OF RADIO ASTRONOMY INSTRUMENTATION: THE NRAO/UVA EDUCATION INITIATIVE

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The desire to engage students in the development of new advanced tools for radio astronomy poses a unique challenge to educators due to the rapidly changing, multi-disciplinary nature of the technology base. The natural evolution of this process has resulted in a high degree of specialization within the science and engineering communities. However, an unfortunate consequence of such specialization is compartmentalization: a paradigm that nurtures the widening chasm between practicing scientists and engineers. A reduction in communications among the disciplines and a weakening of the overall decision-making process are both products of this trend. If allowed to continue, our field will become driven by a collection of experts whose ensemble understanding of the field lacks the far-reaching vision, strong motivation, and sound leadership necessary to accomplish the challenging tasks before us.

Reversing this trend will require a new approach to educating our students. This approach should provide a means for students at all academic levels to participate in the development of new instrumentation while not placing any student in the critical path of a major project. Activities should challenge individual students and promote integration of the disciplines while focused squarely on achieving goals at the forefront of both science and technology. We have created a project-based educational program that attempts to address these challenges.

Our instrument program is designed to blend significant amounts of modern science and technology into a unified educational experience. Student activities include project planning, management, design, fabrication, evaluation, observing, and data analysis. We integrate students into project teams that consist of scientists and engineers together with other students, yet we strive to maintain the student's individuality throughout the entire process. These teams involve people from NRAO and University of Virginia as well as collaborators from many other organizations. NRAO provides the instrument laboratory and deployment infrastructure and a wealth of practical experience from members of the research staff.

My presentation will include an overview of our instrument program, details of the radio astronomy projects, and our vision for the future.

Abstract Submission Form

2006 National Radio Science Meeting

Abstract: bradley2993

Date Received: September 17, 2005

1. (a)

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2. J - Radio Astronomy

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4. I - Invited Paper

5. No special instructions