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Doing Research with Undergraduates in a Bachelor's-only Physics and Astronomy Department: Challenges and Successes

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For many disciplines, it appears that the number of undergraduates involved in research is increasing. One can certainly argue that this is true for physics and astronomy. This is encouraging given the range of benefits students gain from such an experience. At UNC, we have been fortunate to have undergraduate research as a component of the program for over 30 years. However, many students are overcome by classwork and do not see research as a viable option during their undergraduate career. Indeed, some are weary of approaching such a challenge given their limited experience with such a process. Moreover, without the extensive research efforts, facilities, graduate student mentors, and other important resources associated with graduate institutions, can an undergraduate program provide a meaningful research experience for its students? Indeed, the lack of funding devoted to student projects and the often-limited external collaborations can have students wondering about opportunities of which they were not aware. They also ask if they have been given the full range of tools for current and future success. These are frequent questions. I would like to discuss some possible answers by telling you about some of the journeys in research my colleagues and I have taken with our undergraduates. With persistent attention to the evolving needs of our students along with an understanding of our advantages and limitations, I believe our program has substantial positive outcomes to report.