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Theoretical Research Fostered by an Undergraduate Environment

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An undergraduate setting entails certain challenges for a faculty member doing research in theoretical physics, but it also offers particular opportunities. While it is possible to succeed in any area of theoretical research at an undergraduate institution, the experience of teaching at the undergraduate level and doing research with undergraduate students naturally leads one to think about problems that, though possibly very interesting, do not require a high level of technical expertise. Such problems tend to be "close to the trunk of the tree of physics," as a colleague has suggested, meaning that they may be closer to the central ideas of physics than many highly specialized problems. In this talk I give examples of research projects in quantum information and quantum foundations that have been stimulated in part by undergraduate-level teaching and carried out with undergraduate collaborators.