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Recommendations on Funding Research from the National Science Foundation

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. . . a nationally competitive, student-centered research university . . .

In a conversation with the Dean of the College of Engineering, Dr. Ashok Saxena suggested looking at federal funding by state normalized for population size. In such a comparison, Arkansas ranked 50th among the fifty states in National Science Foundation

Research is formalized curiosity. It is poking and prying with a purpose. [Zora Nell Thurston](#),
American author

funding per person during federal fiscal year 2003. Each Arkansas citizen realized a return of \$3.66 from his or her tax dollar investment in the NSF compared to \$4.75 returned to each West Virginia citizen, the 49th ranked state. In this competition, Mississippi ranked 47th at

Lost in a gloom of uninspired research.
[William Wordsworth](#), English poet

\$6.21. At the top of the scale is Massachusetts at \$58.59 per person. That state had a 235-year headstart on establishing

research universities and has built on that lead. The complete set of data may be found on the Graduate School [website](#).

At this website you may also find data on two other sources of research funding – the National Institutes of Health and earmarked (pork barrel) spending as reported in the *Chronicle of Higher Education*. Arkansans do somewhat better in their return from these sources, ranking 41st in NIH funding (\$19.80 per person) and 31st in earmarked funding (\$4.86 per person) among the fifty states in the latest year available. NIH funding in Arkansas is largely due to faculty at the University of Arkansas for Medical Sciences who were responsible for 80% of the state total in federal fiscal year 2002. Among the states the number one player in this arenas is—you guessed it—Massachusetts (\$295.18 per person). In the earmarked funding category it helps to have either an early primary or a large

number of senators per capita. The number one and two states in earmarked dollars per capita in FY2002 were New Hampshire (\$50.41) and North Dakota (\$49.52).

The disparity of research funding among the states can be addressed at both the macro and the micro levels. At the macro level the [Making the Case](#) report by the 2010 Commission made a clear case for the importance of strong research institutions to a state's economy. Ironically, this was a call heard more clearly in other states than in the halls of our own legislative body in Little Rock, preoccupied as they are with more immediate crises. At the micro level, the faculty at the University of Arkansas are among a small minority of Arkansans who are in a position to do anything about the disparity in federal funding. Proposals from this campus accounted for 69% of all NSF dollars awarded to colleges and universities in the state during fiscal year 2003.

The best and most accessible expertise on suggestions for competing for federal funding is among our own colleagues. I have listed some of my own recommendations below. These are largely gleaned from former NSF program managers. I invite you to add your suggestions and comments to those I have listed.

Stay connected. Colleagues and professional societies are often the best sources of information on funding opportunities. The Office of Research and Sponsored Programs maintains a list of Funding Opportunity Alert Services on their [website](#). These include registered services such as SMARTS which email funding alerts to investigators based on a keyword profile. It is worthwhile to seek assistance in tailoring your profile to filter out those opportunities that are worth reading.

Submit a proposal. This one seems obvious, but is the most important. If a proposal is rejected, respond to the reviews, and send it in again. We are doing well here with the number of proposals submitted on this campus increasing 20% over the past two years.

The acquisition of knowledge is the mission of research, the transmission of knowledge is the mission of teaching and the application of knowledge is the mission of public service. [James A. Perkins](#), President, Cornell University

Ask for help from your colleagues. This requires finishing the proposal more than twenty-four hours before it is due. Give other people time

to read it. Especially if they have served on a review panel in the field or had successful proposals of their own.

Visit funding agencies. Funding is available from the Vice Provost for Research for this purpose. Talk to program managers in your discipline and leave a business card. You won't get any commitments, but you will get some good ideas and perhaps an invitation to review proposals—another worthwhile activity.

Be obvious. Read and follow the program solicitation. This is not the place to be creative. Know what the reviewers are looking for and tell them straight out. For NSF proposals your summary must have a paragraph that begins, “The intellectual merit of this research is . . .” and another paragraph that begins, “The broader impacts of this research are . . .”

Imagine sitting down to read twelve of whatever you're writing. This is what the reviewer will be doing, or worse. Don't cram in all the prose the guidelines will allow. Use graphics, timelines, flowcharts and other aids to get your point across and make your proposal memorable.

Address sustainability. Funding agencies want to make an impact that persists beyond the grant period. Where appropriate, establish how your proposal furthers the long-term goals of the University as expressed in *Making the Case* and *Picking Up the Pace* reports.

Include a solid bibliography. This proves you know the field and are building on past work rather than reinventing the wheel. Use standard archival references. Your bibliography should not look like the return from a *Google* search.

Think outside the box. Seek collaborations that cross departmental, college, and campus boundaries. Seek business, industrial or public school collaborators when appropriate. Confirm collaborations with meaningful letters of support.

It's not just about basic research in science and engineering. Even traditional

Research is four things: brains with which to think, eyes with which to see, machines with which to measure and, fourth, money. [Albert Szent-Györgyi](#), 1937 Nobel laureate in medicine

funding agencies like the NSF are concerned about workforce issues, social implications, quality of life, public education, diversity, and accessibility. For example, the NSF recently made a networking grant to the New World Symphony.

If we were to raise NSF per capita funding in Arkansas to the national average, it would produce an additional \$36.5M in federal funds to the Arkansas economy each year. The same transformation in NIH funding would yield an additional \$124M annually. The stakes are high; the challenges are formidable; the opportunities are abundant.

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