What physics research is available to me?
Most physics majors collaborate with physics faculty on research projects. These projects are supported by AU Faculty Research grants, National Science Foundation (NSF) grants, and other sources of funding. Analysis is typically performed on dedicated departmental research computers, but sometimes taps into cutting edge computer farms elsewhere. Occasionally, projects incur travel to national and international laboratories such as Argonne National Laboratory and the Deutsches Elektronen-Synchrotron.

Is research required?
Yes. The course Independent Study/Research PHYS495 is a requirement for all physics and biophysics majors. It is highly recommended that each physics or biophysics major participate in at least one project with a faculty member. The courses Senior Honors Project/Thesis HONS496/497 are also required of all students in the John Nevins Andrews Honors Program.

How do I get started in research?
You chat informally with each physics faculty member about his/her research. You determine the best match between your interests, working style, and expertise, and theirs. Once you decide on a project, you determine and schedule your research goals with your advisor and make financial arrangements for your expenses and income. There are a number of topics to choose from, as spelled out in the current Faculty Research Interests FAQ.

How much time is involved? How long do I stay with a project?
It all depends on the project and your personal goals. You could be involved from 2 hours to 20 hours a week during the fall and spring semesters, and 20 or more hours a week during the summer. Typically, a student seriously involved in research spends 6 hrs/wk for 30 weeks in the academic year and 40 hrs/wk or more for 2 months in the summer. How long you stay with a project is up to you and your advisor. A multi-year commitment may be required because of the time investment it takes to bring you up to speed on specialized techniques.

What will it cost me to do research with an Andrews professor?
All direct research expenses are paid through a research grant. Expenses associated with research travel to off-campus will also be covered. If you choose to receive academic credit, you will enroll and pay for 1-3 credits of PHYS495 or HONS495.

Do I get paid for doing research?
You are paid for your research involvement at an hourly rate comparable with other work in the department, or you will be offered a lump sum stipend or a research scholarship, depending on the stipulations of the grant supporting the project.

Undergraduate Student Research Scholarships
The Office of Scholarly Research offers awards of $750 per semester for research conducted in collaboration with an Andrews professor. Thus free you from having to work elsewhere to defray your educational expenses. A minimum of 90 hours is expected for each award of $750. Additional awards are available for summer research, making it possible for serious engaged students to get up to $3000 in one calendar year.

Will I publish my results? Does it make any difference?
Past students have published their findings as joint authors in refereed journals. Other venues such as the Journal of Undergraduate Research and internal technical notes are also possible. When research is conducted in the context of a large international collaboration and its publication policies, it may not be possible for you to co-author unless you work full-time for 6 months to a full year.

Published research in recognized journals has a very positive effect on your future. It documents your research experience and highlights your strengths. It is a plus in your resume when you search for employment or apply for graduate school or professional programs, particularly because it is unusual for undergraduates to get professional research experience. Publications can put you on the fast track for research assistantships and fellowships in graduate school.

Will I give presentations of my research? Why?
You present your research findings at Physics on Rye (POR), the weekly departmental colloquium. You get experience explaining your work and fielding questions in a non-threatening but exacting audience. If you plan to graduate with Honors, you take the course Research Pro-Seminar (HONS398) on research methods, public speaking, and presentation and give an interdisciplinary talk. The department also encourages and arranges for you to present at the annual Argonne Symposium for Undergraduates in Science, Engineering, and Mathematics and helps you write up an appropriate abstract.

Physics faculty give you opportunities, encouragement, and help that develop your skills and ability to communicate technical material effectively. You acquire a definite edge for graduate school and industry and any other venue or discipline since it is a very transferable skill. You do not get this kind of preparation in most large research universities where you rarely interact with professors and there are few opportunities to give presentations. In our department, you talk with your professors every day and there are lots of opportunities. Alumni say it is one of our most valuable contributions to their success.

Can I do research by myself?
Because of the complexity of most research projects, it is not usually practical for students to conduct their own research. However, faculty members are generally available for consulting, and there are some limited resources in support of a student’s independent research.

Grants-in-Aid of Research Sigma Xi, an international research honor society, offers $100 to $1000 in their Grants-in-Aid of Research program to support student research upon the recommendation of two faculty members. All the physics faculty are members of Sigma Xi and students who engage significantly in research are eligible for nomination as Associate Members.