

PROPOSAL ON  
UNDERGRADUATE RESEARCH

FEBRUARY 2008

THE STUDENT COMMITTEE ON UNDERGRADUATE EDUCATION

## **Executive Summary**

The University of Pennsylvania is a preeminent and widely-respected institution of research that attracts top scholars, graduate students, and undergraduate students who wish to contribute to and learn from the creation of knowledge occurring on this campus. After spending the past several months investigating research opportunities for Penn undergraduates, we, the Student Committee on Undergraduate Education (SCUE), recommend that the university strengthen and democratize undergraduate research at Penn. In particular, our proposals aim to improve access to research, number and quality of opportunities, and guidance for undergraduates throughout the process.

First, based within CURF we recommend establishing positions for Faculty Research Advisors to specialize in broad areas (i.e. humanities, social sciences, etc.) who will guide undergraduates towards opportunities in their respective fields. We further recommend a system of Peer Research Advisors to complement those efforts, while leveraging their experience as upperclassmen who have already navigated through many areas of Penn.

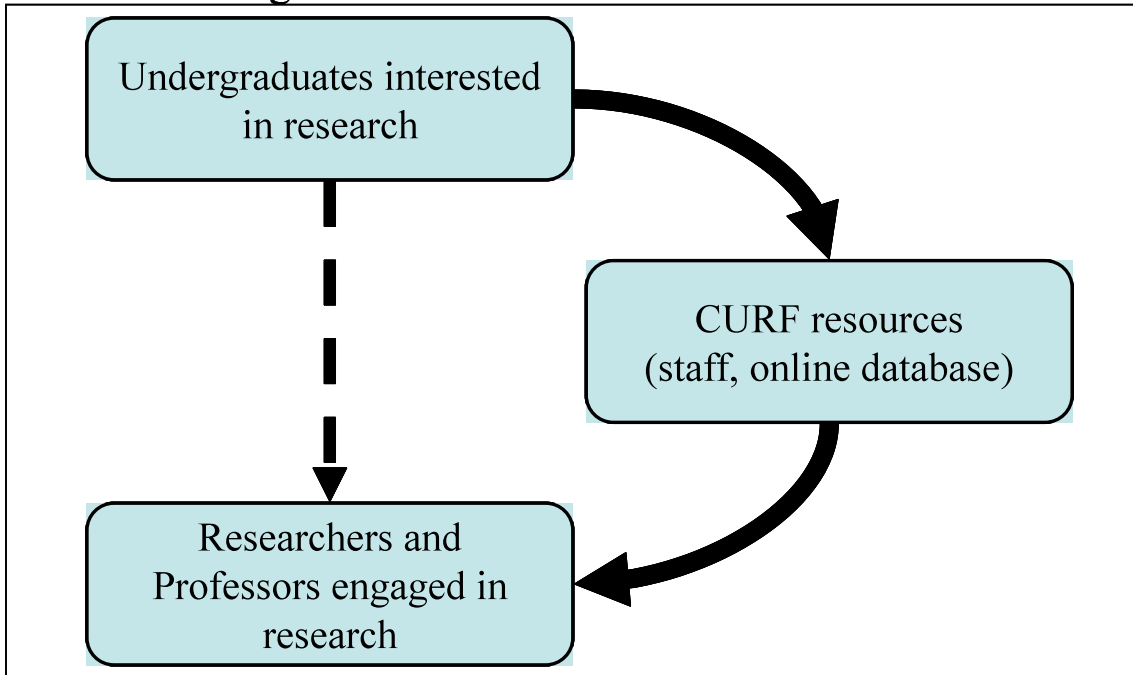
Second, we recommend a liaison system to be centralized within CURF, which would designate experienced faculty members in each department (i.e. chair, undergraduate coordinator) to be a link connecting CURF, interested undergrads, and the faculty researchers in that department.

Third, we recommend an extensive improvement to the website, both to the information it contains and its database of research opportunities, as well as proposing a sustainable plan for its maintenance.

Fourth, we recommend the expansion of the current outreach to freshman by including a panel of undergraduates who have research experience and by creating other programs which demonstrate, to the importance of research to a Penn education.

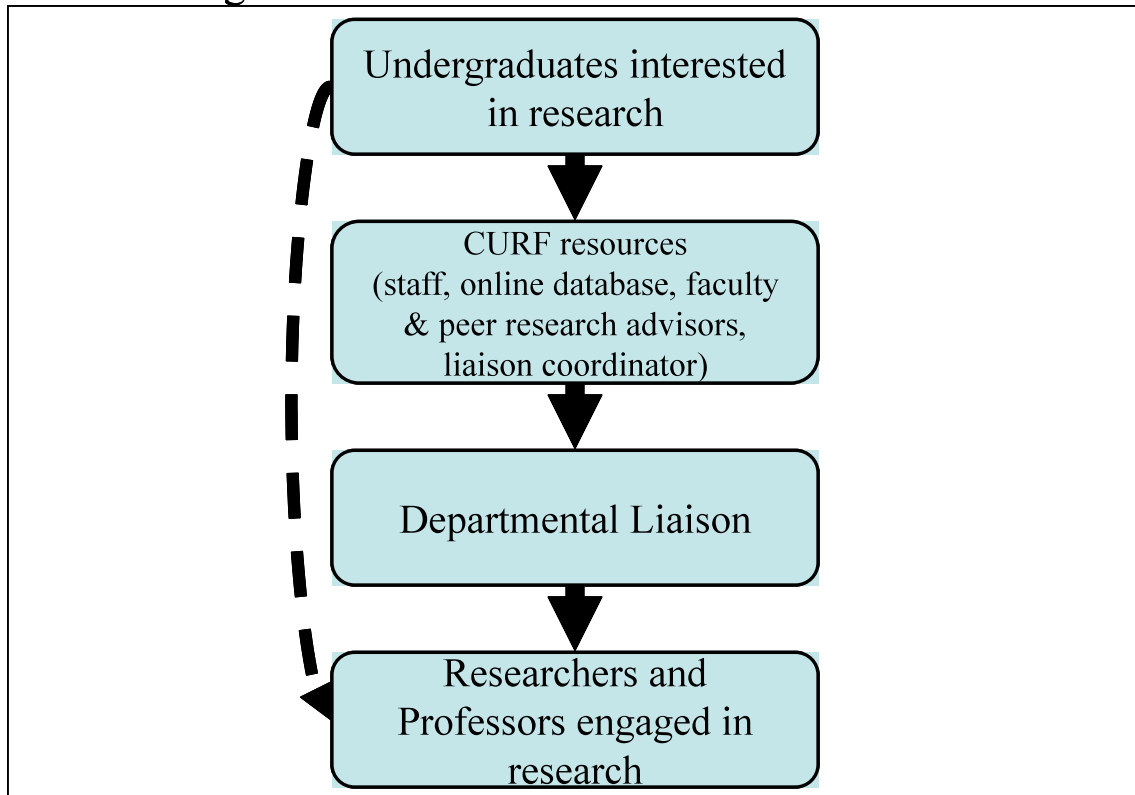
We feel that these recommendations will contribute to undergraduate research and fellowships at Penn, enabling undergraduates to grow intellectually, develop research skills, work with leading scholars, and think creatively and independently. A more inclusive, effective, and innovative undergraduate research program will only confirm and elevate Penn's place in the scholarly community.

## Current Undergraduate Research Model



*Note: This model shows the current path of research-seeking for the average Penn undergraduate who is not affiliated with University Scholars. Dashed line indicates an informal relationship.*

## Ideal Undergraduate Research Model



*Note: Dashed line indicates an informal relationship.*

## **I. Introduction**

As the Student Committee on Undergraduate Education (SCUE), we focus on the undergraduate academic environment and the intellectual community at the University of Pennsylvania. It is our goal to improve the Penn undergraduate experience by creating more avenues for interest-driven intellectual pursuits. Research is forefront among these pursuits and as such, we as SCUE feel that is essential that Penn provide its undergraduates with an extensive network of options for any and all undergraduate students interested in research in all of the schools. This document outlines the ways in which the existing system for undergraduate research currently addresses the needs of the student body and the ways in which the system can be improved to better serve the Penn community. This proposal also outlines the characteristics, programs, and services that SCUE believes Penn would ideally provide for students who wish to participate in research, and the means to create access to these options. It is our hope that in the future more students in every field will engage in research. We feel that exposure to a research environment is invaluable to a student's educational pursuits as well to the overall undergraduate experience.

## **II. Status Quo**

The Center for Undergraduate Research and Fellowships (CURF) is the current hub for undergraduate research at The University of Pennsylvania. Home to the University Scholars and Benjamin Franklin Scholars, the center, according to its website, also “provides information and assistance for undergraduates applying for University and other sources of funding for research and research-related activities.” CURF currently uses its office staff and website towards this end. Outside of these options, however, undergraduates interested in research must seek their own mentors through informal channels, including in-class professor announcements, department postings, or personal appeals. Most of these opportunities require research experience and a confidence that many underclassmen lack. In addition, many of these opportunities are unpaid, which is not a feasible option for some students.

### **A. The CURF Website**

Many of the resources the center provides are accessible on the CURF website, which serves not only the undergraduate research community but also Benjamin Franklin and University Scholars. This website is perhaps the most visible source of information for undergraduates pursuing research opportunities at Penn.

Currently, the site has a link for research, which sends students to a webpage that contains information and resources. The first link on the research page is named “*getting started*.” It takes students to a page outlining the reasons to and benefits of research, when and how to begin, and how to come up with ideas and find projects. The next link on the research page connects to a list of grants for which students can apply, providing an array of 28 different grants either funded through CURF or by individual departments. Although this information is useful, the list is hard to find on the website and has a surprising number of grammatical errors. It also contains an opportunity that has expired or existed in previous years, but that has not been updated to reflect current applicants. Eight of the opportunities currently listed have due dates in 2008, whereas the remainder are not specific. In addition to this list of grants, there is a link on the research page to

## CURF Humanities Internships.

Another significant link on the website is the CURF research directory which allows students to search for professors seeking undergraduate researchers. Students can select from a list of subject areas: Biomedical Sciences, Business and Economics, Engineering and Computing, Humanities and Social Science, and Physical and Theoretical Science. Currently, the database has 101 entries in a variety of fields for an undergraduate population of approximately 10,000 students. Additionally, of these only 23 were posted in the past year. Thus, the directory is not well-updated or well-utilized. According to one student who participated in a SCUE-led focus group, "CURF is for fellowship and research opportunities, so it's hard to find specific information about what you're looking for. I think there is some database that describes research opportunities, but if I remember correctly, it's not user friendly." Another student in the same focus group similarly noted that the database should be "constantly updated" and that it would be beneficial if CURF "emailed you reminders of when the deadlines [from the database] are." The usability of the database was originally clouded by a security breach, which forced a system overhaul and recoding. Although the research database is a great resource in theory, the low number of current research opportunities means that the database is only useful to the minority of students who are interested in those resources presented. It is unclear at this point whether the low number of opportunities stems from a lack of professors' interest or from difficulties in physically uploading the options onto the page. According to Dr. Harriet Joseph, the interim director of CURF, the system has been recently updated to prevent hacking and to allow professors to upload listings more easily. In a brief meeting with Dr. Joseph in early October, she mentioned that an e-mail had been sent out to professors with information about the database as well as a description of how these professors could update their research opportunities on the directory.

In addition, there is another link on the research page to "summer programs," which is a compilation of funded and non-funded options for students interested in summer research. The site states that "[t]here are many, many structured research-oriented programs available for undergraduates during the summers. They vary in their details but in general admit a small number of students who combine seminar-style learning with carrying out an independent project." It then goes on to give eleven examples of these programs, from the National Science Foundation Research Experience for Undergraduates to The Smithsonian's list of "paid and unpaid internships." At the bottom, it also provides two links, one to Swarthmore's pre-med advising page, and one to Yale University's list of summer fellowship opportunities. This page is not only disorganized, but also does not adequately address the "many, many" options that are apparently available to Penn students.

The last important link on the CURF page is a tutorial that is meant to help students find faculty mentors. A paragraph on this page makes its message clear: "Penn does not have a research job placement service or a research match-making program. Each student must first clarify in what area of expertise she/he seeks a mentor, then investigate researchers in that area to find those whose current research interests best match the student's topic. Finally, the student must approach, and, in some cases, persuade the researcher to take on the student." Following this statement are links to the entire list of research centers and institutes at the University (there are 167), the faculty lists of all of the undergraduate schools, and the research directory. This

provides potential student researchers with an overwhelming list of options that is almost impossible to navigate and that is only useful for students who have extremely specific, well-defined interests.

One senior undergraduate in the Vagelos program found that, upon beginning her search for research, "one of the professors' information hadn't been updated in two years so I didn't really know what to do. I found out from other people too that the best way to start was to start asking around and emailing people. But I was a sophomore; I was definitely intimidated to email some big time researcher and tell them, 'Hey, I have no experience but I want to come and work with you.' But they were much more welcoming than I expected them to be." As such, many Penn undergraduates find the CURF website to be both difficult to navigate and outdated, which can be discouraging to students new to the research process.

### **B. CURF Staff, the ARCH, and Programs**

The Arts, Research and Culture House (ARCH) is the physical location of CURF on Penn's campus. Located on the corner of 36th and Locust, the Arch also houses a few of Penn's ethnic heritage groups, namely PAACH (the Pan Asian American Community House); La Casa Latina; and Umoja (serving all students of the African diaspora). CURF occupies a space on the second floor of the building. The University and Benjamin Franklin Scholars advisors have their offices there, as does the research coordinator. Currently, Dr. Harriet Joseph serves both as the Interim Director of CURF and as the Associate Director of University Scholars. Linda Wiedmann and Dr. Paul Heiney serve as associate and faculty directors of Benjamin Franklin Scholars. Dr. Michael Zuckerman and Dr. Max Mintz are the faculty directors of University Scholars. The Center also employs Cheryl Shipman as the "research coordinator," whose job is to "provide administrative support (details and deadlines) for fellowship applicants, as well as advising and assisting those seeking research opportunities and funding," according to the CURF website.

Currently, CURF's most active student researchers are members of the University Scholars Program. According to the website, "The University Scholars program provides an unusual academic environment for intellectually dynamic students who have already demonstrated their commitment and dedication to research. Through mentoring, research funding and scholarly events the program encourages and supports students to make the most of their undergraduate years, not only with in-depth research, but also by making an early start in graduate and professional courses, ranging widely or in some cases focusing narrowly on their curricular choices." These students are either chosen during their Penn application process or apply into the program as sophomores or juniors. If the students are selected before their matriculation, they are assigned a "research mentor" who helps them find faculty with matching interests. Sophomores and juniors applying to the program must already be active in research and have a specific project they would like to pursue, as well as a mentor to help them.

Once a student becomes a University Scholar, he has a variety of useful resources at his disposal. Most importantly, CURF has a specific amount of funding set aside for these students. As this pool of money is large, these students have no problem finding funding for their summer or school year research. As it states on the website, "In order to aid students in doing creative and in-depth research, the University Scholars has a fund with which to help students defray research

expenses. Funding is meant to cover the expense of the research itself; this most often pertains to room and board costs over the summer months. Occasionally, students' research will take them away from Penn. In those instances, the University Scholars program may be able to fund travel expenses as well." In addition to the readily available funding, these students have a lot of support along the way. For one, Harriet Joseph serves as an academic advisor. The students also have the option of attending weekly research luncheons in which they have an opportunity to present their work and to listen to presentations given by their fellow scholars in a variety of fields.

University Scholars serves as a useful model because it serves to foster a culture of research and provides a variety of resources for its students. However, the program only serves between 30 and 40 students from each graduating class, a small minority of the Penn undergraduate population. The apparent elitism of the program has led to complaints among other undergraduates that only a small population of the school has access to the research resources available, leaving the rest without options. A freshman in one of the focus groups noted, "From what I noticed with CURF, it's a lot of BFS and U[niversity] Scholars, who are primarily picked at the application process. And, well, I'm a freshman...and that's ages ago. So I have a problem with that, because it's discouraging..." He went on to explain that the programs should be open to those with genuine research interests, regardless of whether or not the students were selected before admission to Penn.

Another program that successfully cultivates undergraduate research is the Provost's Undergraduate Research Mentoring Program. The program is meant for freshmen who intend to research with a Penn professor during the summer before their sophomore year. Student applicants choose from a list of professor's projects (each faculty member can list up to three options). Selected students receive a \$4,000 summer stipend and their faculty mentors receive \$3,500 to cover costs of the project. The first year the program was implemented, for the 2007 summer, 135 students applied and only 18 rising sophomores were selected to work on 16 different projects. Because of the high cost of funding each undergraduate-faculty pair, the program was only able to reach a small number of students.

Students not involved in either the University Scholar program or the Provost's Undergraduate Research Mentoring Program have limited options for funding and scant resources to help them find research mentors. Undergraduates are not encouraged to apply for University Scholars unless they have an extremely specific interest and a research mentor already lined up. For those without either, the only option seems to be the daunting task of knocking on professors' doors. These professors, as even the CURF website explicitly states, are sometimes hesitant and need to be persuaded. Although there are some useful resources provided by CURF, and myriad grants to which students can apply, the student body is widely unaware of these options as they are mainly intended for those already selected into one of the honors programs.

### **III. Ideal Vision**

The University of Pennsylvania is a preeminent research institution with global reach and reputation. The University's twelve centrally located graduate schools have the potential to provide a unique number of opportunities for undergraduates interested in research in a variety of

different areas. In addition, the diversity of the city of Philadelphia provides an almost unlimited amount of research possibilities, as does Penn's extensive international reach. Our wish as SCUE is to empower the entire undergraduate student body, providing students with unparalleled research experiences by allowing for increased accessibility, opportunity, and guidance within all university disciplines. Towards this goal, we envision that undergraduate research remain centered within the Center for Undergraduate Research and Fellowships (CURF), which will serve as the focal point for informing and advising undergraduates in research opportunities. We anticipate that, if fully utilized, undergraduate research will perpetuate and enhance Penn's reputation as a world-renowned research institution.

### **A. Faculty/Staff Research Advisors**

CURF would benefit from the addition of several faculty research mentors. These mentors would serve as permanent research advisors to any and all students interested in completing research as an undergraduate at Penn. There would be one advisor to represent each of the central fields of research (i.e. humanities, public and social policy, physical sciences, economics and business, life sciences, etc). These advisors would have close relationships with the related coordinators of research in other schools, for instance, Wharton's Research and Scholars Program. Adding these advisors would ease the burden of work on the current CURF advisors who are focuses on honors programs and fellowships. Moreover, each of these staff members would be able to assist students with every aspect of the process. When students make their first appointment, the advisor would start by helping them peg down the specific field they would like to study. This process is often difficult for students with a variety of interests, particularly for freshman who have not decided on a major. From there, the advisor would discuss possibilities for research opportunities in that field, ranging from setting them up with the research liaison in that department (see C. **Liaison System**) to directing them towards particular grants for which they might apply. After the student successfully finds a faculty member willing to take them on, the role of the CURF research advisor would transform into that of an advisor, helping the student acquire funding, encouraging them to apply for University Scholars or other Penn programs, and aiding them with any concerns they have in their research. The student would be able to meet with this same advisor at any point in their Penn research career and would be able to rely on this person as a continuing support system for their research. Although this remains a more long-term goal, we feel that until more staff members can be hired, students should be encouraged to meet with Cheryl Shipman, the existing research coordinator. It is essential that students receive guidance with the research process because it can often be daunting to approach research as a young undergraduate with no previous experience.

### **B. Peer Research Advisors**

Alongside the faculty research advisors, SCUE proposes the creation of a specific peer-mentoring program to help facilitate a new pool of mentors for interested freshman and sophomores. Ideally, this program would consist of a database of peers that are currently and actively engaged in research. These upperclassmen would be able and willing to speak about their experience in research at Penn, how they got involved in these experiences, and why they got involved. These undergraduates have already gone through the process of independently

searching a broad field of interests and narrowing down opportunities to one exciting research experience. They would possess the experience and knowledge of an academic area at Penn, and undergraduates with little or no research experience could truly benefit from their guidance. These students would attend a brief training session before they were made available to underclassmen, complementing the training given to current peer advisors. By allowing underclassmen to learn from those students who have successfully navigated research at Penn, these older students would be invaluable resources for inexperienced undergraduates eager to start the research process but unsure of how to proceed.

### **C. Liaison System**

Currently, research opportunities are not completely centralized at CURF, and students, for the most part, must individually approach professors in order to pursue research in a field in which they are interested. In order to help centralize and standardize the research process, SCUE proposes the implementation of a formalized liaison system. We recognize that no single individual or even group of three individuals can be solely responsible for the entirety of undergraduate research at Penn. Instead, we offer an alternative in which every Penn department, center, and program will have a designated liaison in contact with CURF. This liaison will most likely be either the department chair, the undergraduate coordinator, another respected experienced professor, or a staff member. The ideal candidate would be someone who is aware of the current research interests of members of their department, and should be trained on how to best provide CURF with this information and advise students on where to go specifically within that field of study. Ideally, this network will create a means for students to easily find professors who are actively looking for undergraduate student researchers.

We feel this system addresses a variety of current insufficiencies in the CURF system. Instead of facing the intimidating prospect of knocking on faculty members' doors, students will be able to go to CURF where they will be directed to a specific liaison contact, whose job it then is to connect them with faculty members who have similar research interests and/or opportunities. This centralizes the accessibility of research options, giving students a solid lead in their search for research opportunities. By easing the burden from CURF for being the sole source of connecting students with research opportunities, the liaison system opens up research to many more undergraduates.

### **D. Website**

According to a student in one of the SCUE focus groups, "I think that a user-friendly website would be the best tool...I feel like that's where I always go when I have questions about anything at Penn. And most of them even the department websites I've found have been really out of date it's just kind of frustrating." This sentiment was consistently emphasized throughout all focus group discussions. As such, part of the SCUE vision is the increased maintenance of the CURF website. It is essential that students have a virtual place to go where they can easily access information about research opportunities, browse for current and up-to-date funding options, and find professors interested in mentoring undergraduates in their field of research. Although the existing website has been an important step towards the realization of this vision, it must be updated in a more timely fashion to prevent the frustration many

undergraduates have faced with the out-dated options listed.

### **E. Freshman Programs**

In the focus group sessions SCUE completed, one common trend was a focus on the freshman experience. Students felt that this experience, particularly during NSO, did little to prepare them for the research they wished to pursue. Freshmen would benefit dramatically from increased accessibility, opportunity, and guidance. One senior noted that she would "prefer if there were more research opportunities from the beginning of... freshman year," saying that she "felt that by the time [she] found topics [she] really wanted to research, it was too late to get funding and too hard to do it on top of everything else, because there was no credit associated with it."

While there is an existing NSO program highlighting research, the session merely consists of a panel of faculty and undergraduate researchers who specifically describe their particular research interests. Although it is meant to encourage new freshmen to pursue research, the presentation does little to teach them how to find research opportunities. By trying to inspire students to research without informing them of how to go about it, this NSO program does not necessarily help students as much as it potentially could.

As a solution to this lack, we propose to hold a comprehensive session during NSO to inform freshman about the many opportunities Penn offers for its undergraduates in the area of research. The panel could either be an extension of the one mentioned above, or would be an additional session required for freshman during one of the orientation days. In SCUE's ideal vision, this panel would be made up of a combination of non-University Scholar and University Scholar students who are actively involved in research in a variety of departments at Penn, in all schools. In addition to these members, CURF would be well represented in the form by one or two research advisors or members of the Penn community who have actively served as either University Scholars mentors or on the University Scholar faculty committee. The central purpose of this session would be specific: teaching students *HOW* to access the research opportunities Penn offers and *WHY* to do research at Penn. These two central points are often overlooked in standard research presentations, but they are essential for students just beginning their Penn experience. The undergraduates on the panel can offer a perspective that the faculty cannot give: namely, how they were able to find opportunities. We feel the undergraduate presence will demonstrate to freshmen that it is quite possible to engage in research and that all undergraduates are encouraged to do so. The faculty and staff members present will be able to offer a perspective from the other side of the research spectrum: particularly what they are specifically looking for in students as advisees or mentees.

After the conference panel, flyers will be passed out that specifically outline the central points from the discussion and appropriate CURF information. This way, students can take home something that reinforces the concept of research in their minds. The brochure will contain key phone numbers and e-mail addresses of people at CURF that can offer them further assistance.

### **IV. Conclusion**

As SCUE, we intend to work with the leaders of The Center for Undergraduate Research and

Fellowships (CURF) and the Offices of the Provost and President to implement these changes. We hope future adjustments at CURF focus on improving access to research, number and quality of opportunities, and guidance for undergraduates throughout the research process.

CURF has made excellent strides over the past decade. It is now the challenge of the leadership of the University to transform this center into a widely accessible resource worthy of the quality undergraduates and faculty it supports, from “excellence to eminence” in the 21st century.