Academic Resources and Computing Committee

Proposal for Funding

Due Thursday, April 1, 2004 (4:30 p.m.)

Project Title: Updating the Forty Year Old Computer Hardware and Software In the Nuclear Lab of the Physics Department

Project Director: Dr. Michelle Arnold

Department(s): Physics

College(s): Science

E-Mail: marnold@weber.edu **Extension:** 7982

Other Members of the Project Team: N/A

Instructions:

1. Please complete each section in the space provided. The justification section should not exceed two single-spaced typed pages. (An addendum may be attached describing details of specific hardware and/or software that are requested with this proposal.)
2. You are required to obtain the signature of an ARCC representative for your college, indicating that she/he is familiar with the proposal, and can speak to it during funding deliberations.
3. Your department chair's signature is also required, indicating that she/he supports the proposal, and that the proposal is in keeping with departmental goals related to information technology and its applications to the academic mission of the institution. Your Chair's signature also indicates her/his commitment to help support the project financially if so indicated on the budget page.
4. Your dean's signature is also required, indicating that she/he has read and supports the project. Your dean's signature also indicates her/his commitment to help support the project financially if so indicated on the budget page.
5. Your college's computer committee must rank the proposal, and the committee chair's signature is required.
6. For certain projects an IT expert's signature is required. You must contact the appropriate individual if you are implementing a wireless network, multimedia classroom, software/hardware purchase that will require use of a campus server or work with online course software like WebCT Vista or ChiTester. You must give time before the deadline - the recommendation is 3 weeks - for that person to do an evaluation.
7. Submit one copy of the proposal, together with all relevant signatures, by 4:30 p.m., Thursday, April 1, 2004. NOTE: the ARCC no longer requires seventeen copies.

8. You must both email a soft copy and mail a hard copy of the proposal to the chair, David Ferro, MC 2401.

ARCC Representative:

I have read the proposal and discussed it with the Project Director.

_____

ARCC Representative

Comments:

Department Chair:

The Department has reviewed this project within the context of overall information technology planning within the Department. If the budget page indicates financial support from the Department, I agree to commit those funds to this project.

_____

Department Chair

Comments:

College Dean:

I have reviewed this project. If the budget page indicates financial support from the College, I agree to commit those funds to this project.

_____

College Dean

Comments:

College Computer Committee Chair:

This proposed project has been reviewed and discussed by our college's computer committee. It is the consensus of the committee that this proposed project is consistent with information technology goals within the college. Furthermore, after ranking all of the proposals submitted by our college, we rank this proposal in priority as

_____ out of a total of _____ proposals submitted this year.*

*Note: Each proposal must be given a separate ranking; no two proposals may receive the same rank.

_____

College Computer Committee Chair

Comments:

IT Representative:

For certain projects an IT expert's signature is required. You must contact the appropriate individual if you are implementing a

WIRELESS NETWORK (**contact Brook Chase at bhchase@weber.edu or x7192)**,

MULTIMEDIA CLASSROOM (**contact Bob King at rking@weber.edu or x6865)**,

CERTAIN SOFTWARE/HARDWARE purchases that will require use of a campus server or work with online course software like WebCT Vista or ChiTester (**contact Ted McGrath at tmcgrath@weber.edu or x7196**).

I have read the proposal and discussed it with the Project Director.

_____

IT Representative (printed and signed)

Comments (including status):

Justification

Your proposed project should be described as clearly and succinctly as possible in the spaces provided below. Be sure to review the "Criteria for Funding" document. *The entire justification section should not exceed two single-spaced pages.*

Abstract (project summary):

This proposal is to update the computer hardware and software in the nuclear lab of the physics department.

There are many types of detectors that can be used to measure different kinds of radiation. When a detector measures radiation it produces an electronic signal that is sent down a cable line. The processing and analysis of the electronic signal is the same for almost all types of detectors. When this technology was first developed over fifty years ago, the electronics used for signal processing consisted of analog components (amplifiers with mechanical buttons and switches, etc.). Since this time, computer hardware and software have increasing replaced the analog components. Over the past decade, digital computer electronics have been developed that can perform complete signal processing. Digital electronics allow for faster signal processing, and computer based electronics result in increased reliability and accuracy. In addition, digital computerized signal processing is the technology which is currently being used but most nuclear programs in both government labs and research institutions nation wide.

This proposal requests funding for the digital electronics computer hardware (DSA 1000), as well as the computer software (Genie 2000) used to interface with this hardware. This upgrade to the nuclear lab will allow both students and faculty to work with modern technology in the field of radiation detection, rather than the almost obsolete analog technology which is currently being used in the lab.

Objectives and goals of this project:

The objective of this proposal is to update the analog electronics of the nuclear lab to digital computerized electronics.

This update to the nuclear lab would put it more inline with the technology that is presently being used in the field. This would allow both students and faculty to conduct more current and relevant research. Most importantly, this would enable our graduates to learn from the same technology that they will encounter after graduation.

Identify specific courses and/or programs that will directly benefit from this project:

(You may also want to describe how specific courses may be enhanced by this project.)

The radiation detector and other equipment in the nuclear physics lab are used for laboratory course work within the Physics department, as well as for research courses by majors within the Physics department and other departments within the College of Science.

A significant portion of PHSX 3640, Advanced Physics Laboratory, is devoted to students learning the equipment and techniques used in experimental nuclear physics. It is very unlikely that physics graduates will encounter analog electronics in either the workplace or in graduate school. Over the past ten years most government labs, industry corporations and research institutions have shifted to digital computer based electronics. The needs of our students would be better served if this upgrade to computer processing is made within the nuclear lab.

In addition to the Advance Lab course, each year there are several students from various departments within the College of Science who conduct research as part of PHSX 2800 or PHSX 4800 using the nuclear lab equipment. The use of computerized electronics would improve the quality and relevance of these research projects, as well as increase the diversity of possible projects. Current research is still being conducted to determine the optimal settings of the computer based electronics for a number of nuclear physics applications.

If applicable, describe how this project will help to increase faculty productivity or enhance competency in some area of information technology.

(Please note that ARCC does not support faculty desktop or laptop computers.)

The computer based signal processing system allows for remote access to the software that operates the computer based electronics hardware. Thus, measurements and data analysis could be performed remotely. The system could be accessed from classroom computers to be used as part of in-class lectures, or by students or faculty presenting their research at a conference.

Describe how the success of this project will be evaluated.

(If reports or publications are anticipated from this project, please indicate such.)

The success of the project will be evaluated via PHSX 3640, and PHSX 2800 and 4800.

The students in PHSX 3640 will perform laboratories with the new computer based electronics and submit lab reports. Their understanding of modern nuclear physics technology will be evaluated through practical lab exams. The increase knowledge of students in regards to current nuclear processing technologies will be the most significant result of this project.

In addition, the breadth of the student research projects that will be available to PHSX 2800 and PHSX 4800 student will be increased. Students in these courses often have the opportunity of presenting their results at a conference or as part of a peer reviewed publication. The increased quality of student research projects available will be another measure of the success of this project.

Timeline:

(If funded, when will this project be implemented?)

If funded, the digital computerized electronics would be installed during the fall of 2004. I will be provided with release time by the Physics department to install the system that semester. The system would be operational in time for the spring 2005 semester.

Budget

Note: Please be as specific as possible regarding requested hardware, software, or other resources (you may include an addendum to describe the hardware). If funds are being committed from other resources, please so indicate.

Hardware:	**ARCC** (Requested)	**Department** (Committed)	**College** (Committed)	**Other** (Committed)
DSA 1000: Digital Spectrum Analyzer	$7500.00	$300.00		
Hardware Subtotals:	$7500.00	$300.00		

Software:	**ARCC** (Requested)	**Department** (Committed)	**College** (Committed)	**Other** (Committed)
Genie 2000: Basic Spectroscopy Software	$800.00	$200.00		
Software Subtotals:	$800.00	$200.00		

Other:	**ARCC** (Requested)	**Department** (Committed)	**College** (Committed)	**Other** (Committed)
Paid Release Time		$3825.00		
Other Subtotals:				
Grand Totals:	$8300.00	$4325.00		

TOTAL FOR PROJECT: __$12 625.00_____ (Sum of all columns)

Additional Resources

Please describe what other resources will be required to implement this project:

(Additional resources may include needs such as Academic Computing technical support or hardware installation through Electronic Services.)