

Dear M&M Academy Members,

Greetings from the Academy. This message follows the beginning of the fall semester. S&T is bursting at the seams! Enrollment is up across campus (~6,550 students), and growth in the Mines & Metallurgy departments is near the record levels of 1982. Of course this success in recruiting new students has placed a heavy load on the departments, particularly in terms of giving students the hands-on lab expertise employers desire in the students. Indeed, this is a tradition that distinguishes S&T graduates.

In this Newsletter the focus is on critical needs of the undergraduate laboratories. I asked each chairman to meet with their faculty and prioritize the equipment needs of the labs. Why? The departments need our continued help. In 1999 the state of Missouri ceased funding the Engineering Equipment Bill, a program that gave the university ~\$800 for each engineering graduate. These funds were used for the maintenance and acquisition of lab equipment. Without this funding the general state of the labs has slowly deteriorated. Combined with the increased enrollment the pressure to go to "demonstration" labs or the complete elimination of labs is mounting. Last year the Academy made a huge difference for the departments, acquiring over \$1M worth of equipment. Past newsletters have highlighted these facilities and the positive impact it has had. The new computer-learning-centers (CLC's) that were dedicated in February have been particularly productive.

We're hoping to see you at the October 23rd Academy meeting. **Please come** – you'll see firsthand how our dedication is making a difference in the lives and success of students. A meeting agenda follows this short note. Highlights:

- Tours will be given to the undergraduate labs, with emphasis on the equipment and facilities the Academy has acquired, and key future needs.
- The criteria for a new faculty recognition award will be finalized.
- The new M&M Academy website will be shown.
- Departmental updates will be given by the Chairmen

One of our Academy Members, Joe Rupp ('72 MetE) and his wife Sally endowed the Thomas J. O'Keefe Lecture Series in January. On Thursday October 22nd at 3:30 p.m. in G-4 Schrenk Hall, Bob Tooke ('62, '66, '72 MetE) will give the inaugural address. So by coming a day earlier you'd be able to attend this event. At this occasion we will also officially announce the establishment of the Thomas J. O'Keefe Student Professional Fund, a new endowment created through the generosity of Academy Member Bill Horst ('51 MetE) and his wife Ann.

The walls of the classroom hallway in McNutt Hall are covered with pictures of the Mines & Metallurgy Academy members. While you might believe these pictures go unnoticed, the reverse is true. Students in Mines & Metallurgy know this group of men and women have invested their time and resources to ensure their continued success. You inspire them. As such, they will remember and give back to future generations as well. It's the best way to thank you, just as we are recognizing the tireless efforts of people who helped us achieve our dreams.

Dianna Tickner
September 2009



Key Needs of the Undergraduate Labs

PoreMaster 60

Cost: \$45K

F(x): Measure Pore Size Distribution of a core

Use: PE 242 Core Analysis

Impact: an important new hand-on experiment for undergraduates



Gas Permeameter

Cost: \$60 K

F(x): Measure gas permeability of a core

Use: PE 242 Core Analysis

Impact: update the an old one (20 year ago)



Microscopy Upgrades

Cost: ~\$120K

F(x): Sample preparation, Reflected Light Microscopes, Digital Cameras, Computers, Software, Flat Panel TV, Cathodoluminescence Scope, \$ Room Modifications

Use: UG Labs: Geo 113, 130, 223, 330, 332, 334, essential to UG research (OURE).

Impact: Expansion of outdated facilities will accommodate student demand, promote effective learning, introduce modern techniques, provide desperately needed services.



X-ray Sample preparation

Cost: ~\$60K

F(x): Equipment to prepares solid samples (rocks, ceramics, concrete) for chemical analysis - for glass disks for XRF analysis, and solutions for AA & ICP(MS) analysis

Use: Geo 130, 275, 330, 334, 375; use by other disciplines e.g., Cer 291: essential to undergraduate research.

Impact: Unable to utilize existing state of the art analytical equipment because of the lack of this ability!



Claisse Fluxer

<http://www.claisse.com/fusion-apparatus-m4-fluxer.php>

m & m academy newsletter

Meeting Agenda October 23, 2009

- | | |
|--------------------|--|
| 8:00 AM | Continental Breakfast |
| 8:30 AM | Opening Remarks
Introductions.
Induction of New Member |
| 8:40 AM | Committee Reports |
| 🍏 | Executive |
| 🍏 | Academy Nominations |
| 🍏 | Scholarship (Scholar Award) |
| 🍏 | Jackling |
| 9:30 AM | University Advancement
Connie Eggert
Vice Chancellor |
| 9:50 AM | Break |
| 10:00 AM | Mines & Met Academy
Website |
| 10:10 AM | Faculty Recognition Award |
| 10:30 AM | Departmental Reports |
| 🍏 | Samuel Frimpong |
| 🍏 | Wayne Huebner |
| 🍏 | Bob Laudon |
| Noon Working Lunch | |
| 1:00 PM | Departmental Tours |
| 2:15 PM | Open Discussion & Wrap-Up |



DUMP TRUCK CONSOLE

USE: Most MinE Courses
IMPACT: Unavailable; Vital for Educating Students
COST: \$250K

EXCAVATOR CONSOLE

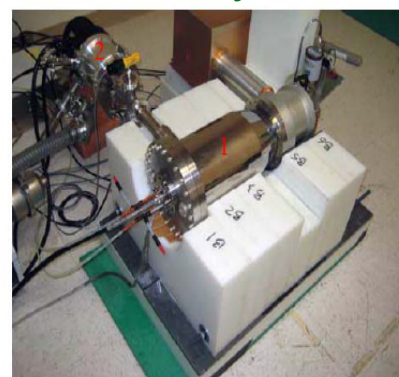
USE: Most MinE Courses
IMPACT: Unavailable; Vital for Educating Students
COST: \$250K

MINE SIMULATOR PAD

USE: Most MinE Courses
IMPACT: Unavailable; Vital for Educating Students
COST: \$150K

KEY NEEDS OF THE UNDERGRADUATE LABORATORIES

(a) AT DD-109 Neutron Generator/ Power Control System



1 – Generator Head, 2 – Turbo Vacuum Pump
Figure 1. AT DD-109 Generator Head.¹



1 – Chiller, 2 – High Voltage Supply, 3 – RF Supply, 4 – Gas Pressure
Figure 2. Power Control Systems.¹

¹DD 109 Neutron Generator Specifications, Adelphi Technology, Inc.

USE: Most NucE Courses

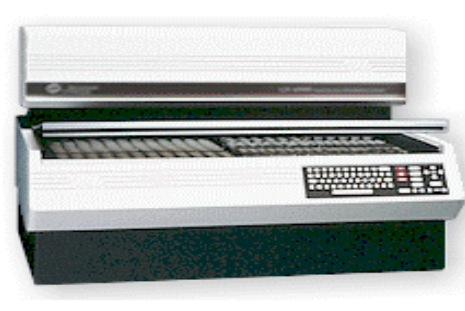
IMPACT: Unavailable; Vital for Educating Students

COST:

AT DD-109 Neutron Generator/Power Control Sys = \$195K

Beckman – 6500 LS Counter = 35K

ORTEC HPGe Detector System = 20K



(b) Beckman – 6500 LS Counter



(c) ORTEC HPGe Detector System

Key Needs of the Undergraduate Labs

Metallography

Cost: \$100K

F(x): sample preparation for microstructural analysis

Use: UG Labs: Cer 231, Cer 242, Met 216, 218, 308, 332 and 421.

Impact: 25 year old Leco stations are worn out & repair parts are unavailable.



Streuers Abramin Polisher



Streuers TegraSystem

X-ray Equipment

Cost: \$135K

F(x): new X-ray diffraction and fluorescence labs for undergraduates.

Use: Cer 291: "Characterization of Materials"

Impact: current lab is a demonstration only; identified as a key weakness.



Rigaku Desktop XRD

Glass Hot Shop Upgrade

Cost: \$25K

F(x): Color glass capability, cold-working

Use: Support of the undergraduate course M. Reidmeyer runs in the Hot Shop

Impact: significant expansion of current facilities; will allow us to accommodate student demand.



General Lab Equipment

Cost: \$50K

F(x): materials processing including an analytical balance, rotary viscometers, zeta potential system, and refractometer.

Use: All UG labs.

Impact: Will allow for multiple groups to run their experiments at one time in parallel compared to in series.



Brookfield rotary viscometer



Analytical balance



Zeta Potential System