

The Physics Newsletter

This, the first of a biweekly newsletter is established in order that students can be better informed regarding activities and developments in the Physics Department. This letter will be used by the chairman, academic advisors, faculty, staff, and students to relay information deemed important to students. Faculty will be encouraged to list employment opportunities for graduates and undergraduates in the newsletter. Students seeking jobs may use the newsletter to list qualifications and type of position preferred.

Periodically we will ask faculty to discuss major developments in their area (e.g. Monopoles - by Gleeson in this letter).

Every student majoring in physics will be assigned a mail box in the hall on the fifth level. The boxes should be checked regularly.

CHAIRMAN'S COMMENTS

T. A. Griffy RLM 5.204

First, I wish to take this opportunity to welcome to the department all of our new physics majors, both freshmen and transfer students. I also want to welcome back to the department for another year the students continuing in our program.

I think we have an excellent set of advisors to work with our undergraduate students. Professors Oakes, Frommhold, Millett and Gleeson have a serious interest in and are very knowledgeable concerning the program in the department and I'm sure you have already found them of considerable assistance. You may find that when a problem arises that they often times will be able to make a simple suggestion to help you solve it. I really appreciate the job they are doing and hope you do as well and will let them know this.

Should there arise any occasions where you feel that you need to talk to the chairman about something, please

Continued on page 3

"PHYSICS FLASHES"

"Monopoles"

by

A. M. Gleeson

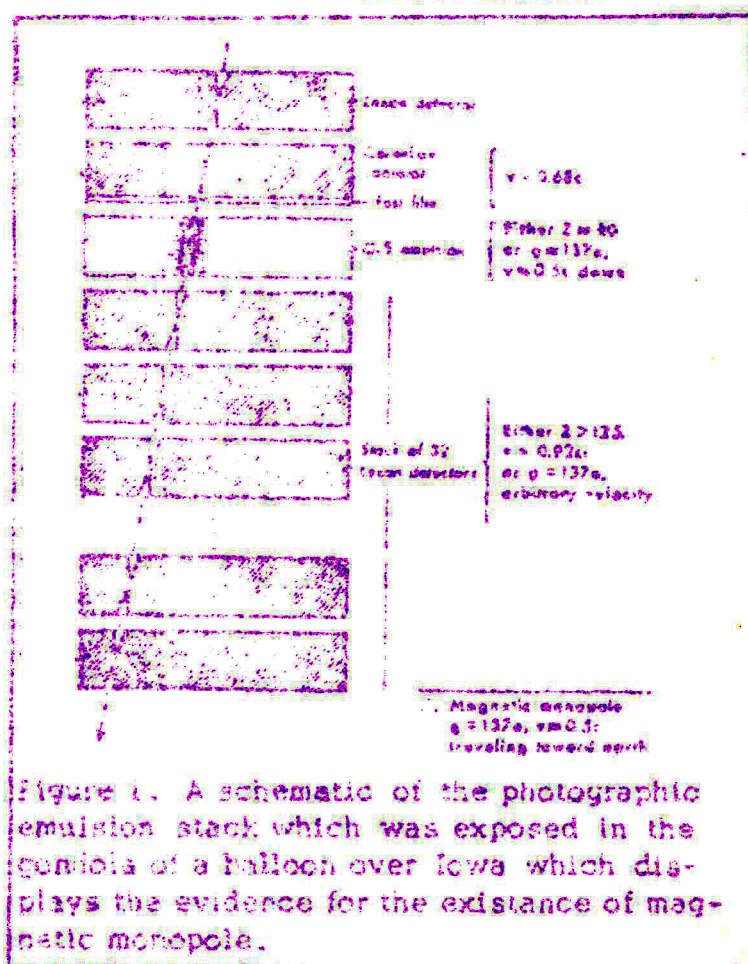


Figure 1. A schematic of the photographic emulsion stack which was exposed in the gondola of a balloon over Iowa which displays the evidence for the existence of magnetic monopole.

The recent announcement of the discovery of evidence for the existence of magnetic monopoles by cosmic ray experimentalists may rank as the most significant media event of the past few years. The monopole is the long sought unit of magnetic charge. Since Maxwell first developed the methods of local field theory and applied them to the unification of the electric and magnetic force systems, physicists have pondered the apparent asymmetry in nature as it manifests itself in the existence of monopole sources of electric force, electric charge, but lack of existence of monopole source of magnetic force, magnetic charge. Magnetic force systems always are traceable to either currents of electric charge or magnetic dipoles. One of the underlying

Continued on page 3

NOTES FROM THE SENIOR ADVISOR
M. E. Oakes RLM 12.226

The deadline for a number of important scholarships are fast approaching. They are:

Marshall Scholarships (Study in the United Kingdom)	Oct. 1
Rhodes Scholarships (Study at Oxford)	Oct. 31
Churchill Scholarships (Cambridge University)	Nov. 7
Danforth Fellowships	Nov. 1

Most of these require that you take the October Graduate Record Exam.

Applications for all awards except the Danforth Fellowships are available in the General and Comparative Studies Office in the West Mall Building 101A. Danforth Fellowship applications may be picked up in the U.T. Provost's Office, Main Building 201. One of our graduates received a Churchill Scholarship last year and we have had a Rhodes Scholar a few years back. If you would like to discuss your chances, drop by.

Seniors considering Graduate School for next year should see the Senior Advisor during September. Important dates for these students are:

Sept. 22	Application Deadline for Graduate Record Exam (GRE)
Oct. 18	Graduate Record Exam (Austin)
Nov. 1	Deadline for Application
Nov. 15	Special Graduate Record Exam (\$5.00 extra fee) Austin
Nov. 12	Deadline for Application
Dec. 13	GRE (St. Ed's or San Marcos)
Dec. 9	Deadline for Application
Jan. 10	GRE (Austin)

Applications are available at the Measurement and Evaluation Center, 2626 Wichita Street.

NOTES FROM THE JUNIOR ADVISOR
Dr. L. W. Frommhold RLM10.324

I would like to take this opportunity to welcome you back for another academic year, and for those of you who have transferred I hope you find the opportunity to stop by so that I may get to know you. My office is RLM 10.324 and my phone number is 471-1182. I will hold office hours MWF from 11-12; or by appointment.

NOTES FROM THE SOPHOMORE ADVISOR
W. E. Millett RLM 2.418

I would like to welcome you back for another academic year and hope that you have any problem or questions concerning your academic program that you will not hesitate to come by and see me. For those of you who have transferred schools and whom I have not had the opportunity to get to know if you would just stop by. My office sometime.

NOTES FROM THE FRESHMAN ADVISOR
A. M. Gleeson RLM 9.324A

To all of you that I have met and especially to those of you that I have not yet had the opportunity to meet, I would like to extend both for myself and my colleagues in the Physics Department a warm welcome to the Physics Department of the University of Texas. We are really pleased that you chose to come here to pursue your studies and hope that we will provide you with the atmosphere and assistance that will enable you to succeed in your career plans. If you have any questions on which either I or the staff can be of assistance please come by to see us. My office hours are MWF 1:00 to 2:00 and in Room RLM 9.324A. The phone number is 471-5158.

The Physics Department Chapter of the Society of Physics Students is sponsoring a "Physnik" in Eastwoods Park on September 26 at 4:00 p.m. The park is located just off campus at 26th and Harris Park. This "Physnik" is intended to serve principally as a mixer for new students and staff and you are therefore the guests of honor and all of us would like to see you there. There will be good company, games, and best of all refreshments. While there you could get to meet more of the further advanced students, investigate the possibility or interest of joining the Society for Physics Students, or gripe about things to hopefully sympathetic ears.

If you are still faced with beginning of the semester course or registration difficulties, come to see us and we may be able to help.

Continued from page 1

"Chairman's Comments"

do not hesitate to come by. My door is figuratively, as well as actually, always open. I hope I have during the coming year an opportunity to meet all of you personally and wish you the best of luck in your studies.

"Monopoles"

axioms of Physics research is that what is must be possible but the converse is also often implied - what is possible must be. Maxwell's equations in their original form showed a lack of symmetry if the magnetic monopole did not exist. The addition of the monopole is not as trivial as the direct addition of a magnetic charge density to the divergence of B term in Maxwell's equations. The analysis of Maxwell's equations in terms of vector potentials is considerably complicated by the simultaneous existance of both types of charges. The first detailed analysis of this problem and the first real attempt to be precise about the verifications of the existance of a monopole solution was carried out by P. A. M. Dirac in 1931. Dirac also pointed out the possibility that the existance of the magnetic monopole may account for the fact that the elementary gravity of electric charge is always quantized in units of the charge of the electron. The theory implied that monopoles should have a magnetic charge of $137e$. This magnetic charge and the fact that magnetic charges would ionize at a uniform rate were the tell tale signatures of the monopole. The figure shows the emulsion stack with its velocity discriminating Cerenkov plates and ion density sensitive g-5 emulsion. A summary of the analysis of this one event is shown in the figure. The conclusion of the existance of the monopole was welcomed by both theoreticians and experimentalists alike. It provided a more symmetric electromagnetic force system and accounted for the existance of a quantum of charge.

Recent reanalysis of the plate geometry with different but reasonable allowances for tolerances seem to indicate that this recent excitement may have been premature. A consistent interpretation of the plates with the event being interpreted as a very high energy plutonium ion or the cosmic ray shower is now the most widely accepted view. These plates are now being reexamined in great detail to see if either of the competing interpretations can be refuted.

SPS NEWS

SPS has traditionally served as the student branch of the American Physical Society at a national level and as such has provided the same basic services such as "Physics Today" and organizing activities of importance to the physics community as a whole, but with special emphasis on the representation of both undergraduate and graduate needs. The Sigma Pi Sigma portion of the organization has functioned as a national honor society.

Here at Texas the functions of SPS are somewhat more immediate in their effect on a student's education and relation to the department. Active membership does not require formal dues paying. It is tacitly assumed that every student is represented by SPS and will take advantage of the services designed to make the department an enjoyable place at which to work. Sigma Pi Sigma has been allowed to fade from prominence since its actual benefit to students, for a \$20 fee, is minimal. Students who qualify for membership will be informed as to procedures for membership but will not be actively sought.

The activities of SPS are sometimes less than visible to the average student, except for the biannual department celebration replete with appropriate libationic and entertainment, better known as the Physnik. In the fall 1st year graduate students are invited as guests of the department to meet the faculty and other students in a more social atmosphere. This fall's pleasure will be held on September 26 at 4:00 p.m. in Eastwoods Park across 26th St from the Law School. The object is thorough enjoyment so come appropriately prepared.

Continued on page 4

The other activities of SPS include representations on the department committees that determine office space needs, computer usage, library services, and the Graduate Student Studies Committee which deals with curriculum, degree requirements, T.A. teaching loads and reviews student progress and/or problems. In each of these areas student members have votes on the committees and take an active role in all decisions, so students should use these people to represent their needs and desires. On a University level SPS represents the department in the Graduate Student Council, in its supplementary efforts and liaison with the faculty and dean.

Obviously the influence of SPS is rather diverse, hopefully students will use it as their form for expounding new ideas and airing their dissatisfaction.

Paul Gleicheuf, SPS President

REMEMBER THE PHYSNIK IS THIS FRIDAY SEPTEMBER 26! TICKETS ARE AVAILABE FROM THE SPS OFFICERS AND IN THE STUDENT OFFICE. COME BY AND PICK YOUR TICKETS UP TODAY. Student tickets are \$1.25 -- Student with date or spouse are \$1.75 -- Faculty/Staff are \$2.00 -- Faculty/Staff with date or spouse are \$2.50. EVERYONE COME AND MAKE THIS A PHYSNIK TO REMEMBER! THE DATE IS SEPTEMBER 26 AT 4:00, DON'T FORGET!!!



"I hate to say this, but, even under our brutally slashed research budget, I've made an important discovery."

--Saturday Review, June 12, 1971

The Physics Student Office would like to remind all students that the office is here to serve you. If you have any questions or problems on which we can help we will do our best to answer your questions or help you find the answers. Our doors are open from 8:00 - 12:00 and from 1:00 - 5:00. Please feel free to stop by every now and then just to say hello and see if there is anything new that you should know about.

The Student Office is located in RLM Rooms 5.214, 5.216, and 5.218. Most of the Undergraduate affairs are handled either in 5.214 or 5.216 by Kathleen Boyle and Jeanie Gregory. Most of the Graduate affairs will be handled by Myrna Payne in 5.218.

FAREWELL FROM KAY BAKER

I would like to welcome all the new physics majors to the Physics Department. I have been here for several years and have seen many very good students graduate from this department with a great feeling of achievement. These first college years are the most important years you will experience in the pursuit of your career. I wish each and every one of you the best of luck. Study hard -- it is worth it in the end.

To all the students I have known and worked with these past few years, I want to say how very much I am going to miss you. It has been one of my greatest experiences working with you, getting to know you, and helping you whenever I could. I think you are all working hard toward future achievements, and wish you all the best. I know you deserve that! Keep up the good work.

Ms. Myrna Payne will be taking my place and I know you will like her. Her office is RLM 5.218 and she will be working directly with the graduate students. Please drop by and introduce yourself to her so she can get to know you.

The party you all gave me was just great! I really enjoyed it and will keep my souvenirs near and dear along with my memories.

Contributions to the "PHYSICS PFUNNIES" are invited as are all contributions to the Physics Newsletter.