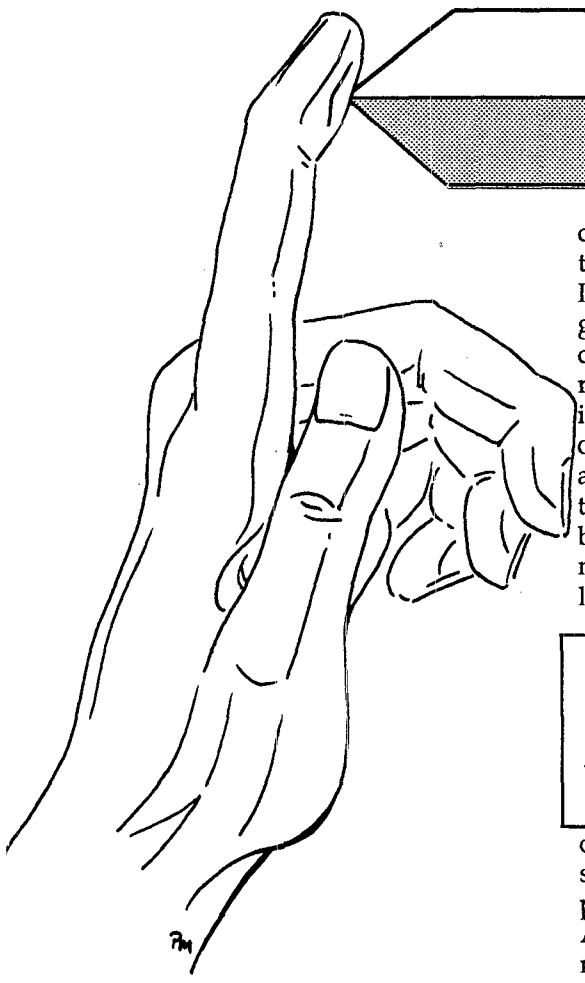
# CRYSTALS



CRYSTALS

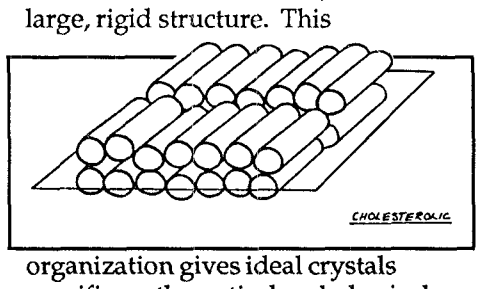
**by Peter MacDougall**

New Age religion proclaims crystals are age-old tools for achieving happiness. Without a doubt, our lives have always been governed by the properties of crystals, but probably not as New Age pilgrims would have us believe.

Crystals are any structure showing some degree of geometric regularity. Almost all pure elements and compounds are capable of forming crystals.

There are two extremes of crustal structure: ideal crystal lattices and cybotactic liquids. In between these two extremes are liquid crystals.

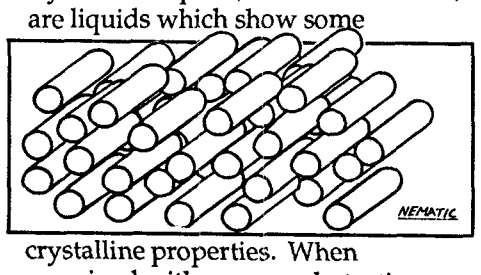
Ideal crystals are rigid solids. The geometric regularity of an ideal crystal comes from a 3D lattice of repeating, polyhedral cells. Each identical cell is composed of a group oof particles which define the size and the shape of the cell. In simpler terms, each cell is like a building block that, when stacked in a regular manner with other blocks, can form a large, rigid structure. This




organization gives ideal crystals specific mathematical and physical properties.

Although ideal crystals do not exist in nature, true crystals have structures that closely resemble this ideal model. Salt crystals, ice, gemstones, minerals, and many crystallized organic compounds are made of rigid, mathematically regular 3D lattices of molecules.

Cybotactic liquids, on the other hand, are liquids which show some

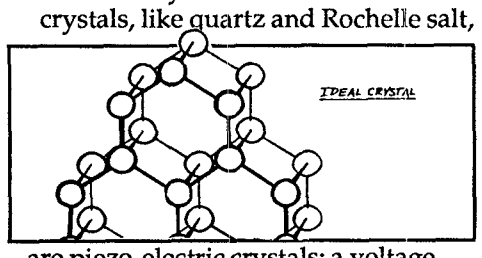



crystalline properties. When examined with x-rays, cybotactic liquids give diffraction patterns that resemble those of powdered crystal. Some liquids that show cybotaxis are alcohols and other organic liquids. The diffraction patterns suggest that the molecules of the liquids are temporarily stacked in rows, layers, or blocks. However, the compounds lack rigid, geometric shapes of true crystals.

Liquid crystals appear intermediate between cybotactic liquids and true crystals. In liquid crystals, there appear to be large groups of molecules that are able to move and turn about with respect to each other, but the molecules within the group retain their 3D structural arrangement. Liquid crystals tend to be more viscous than cybotactic liquids and have more structural regularity.

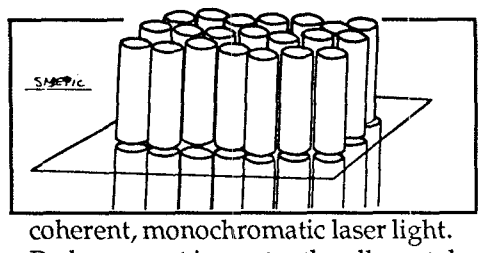
There are three types of liquid crystals: smectic, where the molecules are arranged in layers and the long axes of the molecules are parallel to each other and perpendicular to the layers; cholesterolic, where the long axes of the molecules are parallel to each other and to the plane of the layers; nematic, where the axes of the molecules are parallel to each other but they are not arranged in definite layers. These different arrangements give the liquid crystals different properties.

The most important properties to come from the regular geometry of crystals are their electromagnetic properties. For example,the spacing of the regular units in most crystals allows crystals to act as diffraction gratings for x-rays. The regular planes of most crystals can refract visible light in regular patterns, like the sparkle in diamonds or the spectra formed by prisms. Some crystals, like germanium and silicon, are rectifying: they pass electric current only in one direction. Other crystals, like quartz and Rochelle salt,




are piezo-electric crystals; a voltage applied across certain faces of the crystal results in a reversible deformation of the crystal or vice versa, while squeezing the crystal results in a potential difference across the crystal. The circular dichroism of cholesterolic liquid crystals is responsible for their temperature dependent iridescent colors. Nematic liquid crystals are more effective in polarizing light when subjected to a magnetic field.

The imperfections and impurities in crystals also change the electromagnetic properties of the crystals. The chromium III impurities in ruby (a-$Al_2O_3$) are responsible for ruby's usefulness in producing




coherent, monochromatic laser light. Perhaps most importantly, all crystal have specific resonant frequencies at which they absorb and emit radiation. For example, the ability of quartz crystals to resonate at different frequencies depending on the voltage applied to the crystals makes them useful in radio tuning and time keeping.

In summary, all crystals react to electromagnetism in specific ways determined by their regular structures.

Strict physical properties aside, New Age religion precepts say that crystals can be used to find spiritual harmony and power. Clear quartz held near a person is supposed to help organize their thoughts; amethyst is supposed to aid the power of intuition, or non-rational thought while rose quartz supposedly soothes the heart (*all useful during an exam!*).

Although the properties associated with crystals by New Age religion do not lend themselves to scientific analysis and therefore remain doubtful at best, it is too cynical to suppose that there cannot be any interaction between crystals and the human body.

Thy body has an electromagnetic field. There is the electric firing of neurons that can be measured by an EEG machine, but also many of the individual molecules of living tissue absorb and emit radiation at different frequencies of the electromagnetic spectrum. The human body can even be magnetized (as can happen NMR). Therefore anything which reacts with electromagnetic fields such as metal and magnets, light, electricity, crystals and so on, at the resonant frequencies of the human body, can affect the body's electromagnetic field.

The effects of such perturbants on human life are essentially unknown and barely studied, but do not seem to be great. The effects of the crystals that surround us and that are even inside us are probably far more physical and subtle than New Age pilgrims believe.

SOME GENERAL CRYSTAL USES

USE: crystal

TIME KEEPING: quartz
AUDIO TECHNOLOGY: diamond and piezo-electric crystal
LIQUID CRYSTAL
DISPLAY: nematic liquid crystals
ELECTRONICS: silicon, germanium, quartz
THERMOMETERS: cholesterolic liquid crystals
OPTICS: lead and silver crystal, quartz

## INSIDE

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SCIENCE WEEK JAN 25th → 29th

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# THE TIME IS NOW !

In 1916, UBC offered the first course in Biology. Since that time the Biological Sciences have flourished. Today they encompass three separate departments (Biology, Botany, and Zoology) within the largest Faculty of the University. Thirty-eight years have passed since the opening of the first wing of Biological Sciences building. Despite the subsequent metamorphosis in the departments, a sense of unity, strength, and comraderie among the students is lacking. It is high time that we form the "Biological Undergraduate Society" which establishes these qualities.

We have a talented, dedicated and extremely diverse staff of professors, T.A.'s and graduate students behind us. The professors work in very multifarious fields and some are world renown authorities in their particular areas of study. Ultimately however, the success of the Biology departments is reflected in the input and hard work by all of us. We represent a truly heterogenous group of individuals. We all have different dreams but also a common interest and only a few short years together to share it. Biology, Botany and Zoology is something we can take pride in belonging to. We have every reason to form our own society.

While both the SUS and the Wildlife Club already provide excellent services we need a new organization. It will have the mandate to adequately represent all the students in the Biological Sciences.

While the Society is in its earliest stages of formation, the goal is for it to become an A.M.S. constituency. This will allow us a $300 yearly budget (plus membership fees) to finance our indefatigably zealous undertakings!

Proposed undertakings include:

1) Weekly meetings: Mainly to show spectacular films (National Geographic etc.), slide shows and invite guest speakers.

2) A paper for articles, interviews and reviews by students as well as for club information.

3) Team participation in intramurals.

4) Beer gardens (Faculty and T.A. participation will be mandatory. This is for unity, comraderie and uninhibited ebriosity !)

5) Socials and Good field trips (Bamfield, Point Renfrew etc.)

6) Promotion of our Departments and studies of interest.

7) Academic advice.

8) A responsible approach to Natural Resources and their conservation.

9) Creation of Graduating Class Compositions.

10) Departmental T-Shirts/Sweatshirts (ie. For Marine Biology, Cell Biology, Genetics, Botany, Zoology etc.) and other paraphernelia.

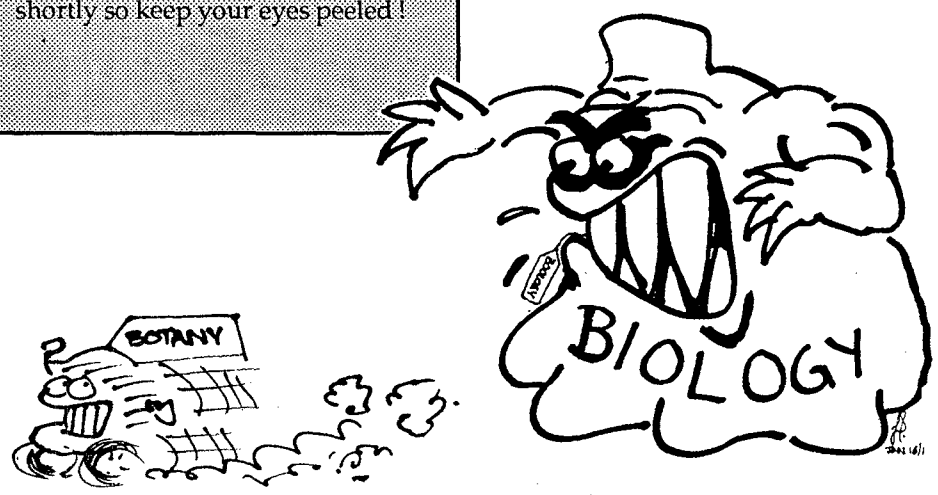
There will also be an executive committee consisting of President, Vice-President, Treasurer, Secretary, and other positions you feel we may need. A representative for SUS meetings and one for Faculty meetings (of which there has been no Biology student representation for umpteen years) must also be nominated.

From meager beginnings Biology has evolved from that first course nearly 70 years ago to its present stature and now the future beckons with new challenges and broader horizons. It is high time we make a mark in the annals of UBC with the formation of this club and the beginning of a new and worthy tradition.

I sincerely believe this club has the potential of being one of UBC's best. The Time is Now !

If you have any questions, suggestions, proposals or ideas by all means contact Jean at 228-4235 (SUS) or Johan at 224-4053. We need you help and involvement.

A general meeting will be held shortly so keep your eyes peeled !




# It's too easy to hide fraud in tiny corners of Science

**by David Suzuki**

How can some scientists get away with fraud, and why do they commit it? These two questions should be investigated in detail for the good of science. Since the end of the Second World War, new technology has depended on scientific innovation. This need has stimulated an explosive growth in the number of scientists that has been accompanied by greater specialization and the use of arcane jargon and tools.

So, for example, where I once called myself a geneticist, today I would be called a specialist in the developmental genetics of fruitflies. For example, this means it is more difficult for me to assess in detail the kind of genetics being done with other areas such as corn, humans or yeast. With greater and greater specialization comes a corresponding loss of breadth, so it's often not as easy for a reviewer or reader to judge the validity of a piece of research. That is part of the explanation of how scientists get away with it.

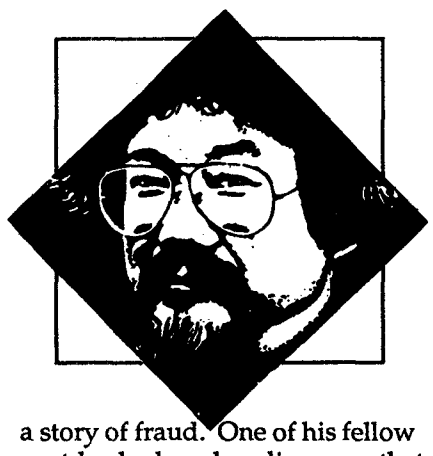
There is another factor: Scientists don't just assess work objectively on the basis of its scientific merits alone. Scientists are human beings, with built-in values and biases. Everyone recognizes that there is a hierarchy of schools - Harvard and Stanford are viewed as superior to Mississippi State or Peoria U. So an article from Harvard or a "big name" scientist will simply not be subject to the same critical scrutiny as a corresponding paper from the University of British Columbia, for example.

"Big Science" done by teams of people has become commonplace. I met a professor who had worked as a postdoctoral fellow (someone recently awarded a PhD degree) in a lab at the California I institute of Technology. He was one of 30 postdocs in that lab. In his three years there, he never had a personal scientific discussion with its director, even though they were co-authors on papers. That may be rare, but it is true that some of the most famous scientist have extremely large groups of people working under them. And the heads of those groups are also the ones who have a heavy speaking schedule, sit on boards of companies and chair committees of universities.

Heads of big labs cannot possibly scrutinize all of the work going on under them, so they have to depend on others to maintain a standard of care and integrity. To sustain their eminent reputations, those heads demand a constant stream of important discoveries from their groups.

The young scientists in the lab depend on the head of the lab for support in finding a good position, so they feel enormous pressure to get results. It becomes fertile ground for shortcuts and fudging.

Years ago when I was host of the radio show Quirks and Quarks, a postdoc in the lab of an eminent Canadian scientist came to me with



a story of fraud. One of his fellow postdoc had made a discovery that brought a great deal of publicity to the lab. This postdoc who came to me had discovered that the work was fraudulent. But the eminent scientist had to much at stake to retract the claims. Consequently, by claiming there was fraud, the young scientist who had approached me was being painted as a troublemaker. He asked me to do an expose on it. I was torn between my roles as scientist and broadcaster.

As a scientist, I knew that the postdoc's boss had long fought for scientific excellence in Canada and had worked to get better support for young scientists. I admired him enormously (and still do), but I also knew that he had simply become too busy to keep in touch with the people in his lab. In spite of his eminence, he had become blinded by his own ambition.

As a broadcaster, I should have prepared the story, but I couldn't bring myself to blow the whistle on someone who had done so much for science. It was totally unprofessional of me to sit on the story, and it finally came out anyway. This personal experience illustrates how fraud can be perpetuated by the reluctance of scientists to do anything about it.

If an important claim is made in science, its fraudulent nature will always be found out because so many other people will jump in to exploit the claim. Obviously, through, fraud is costly because a lot of work has to be done before the wrong is corrected. But today, with all of the pressure to capitalize on new discoveries for profit, scientists tend to be more secretive, and this has encouraged another kind of cheating in science.

Science depends on the open and free exchange of ideas. But now that the interval between discovery and application has become very short, people are often reluctant to share new information. Each year, scientists apply for research grants. Those applications must provide in minute detail both the rationale and experimental design of the proposed work. So those grant proposals represent ideas at the cutting edge of research.

The scientists who assess those grants are usually in the same research area as the applicant. The reviewers must often get new ideas from reading those grants. What is to prevent them from listing those ideas and scooping the applicant? It's a thorny problem that, at present, depends on the assumption of honesty and integrity within the scientific community.

But a large crack is appearing in this notion. Recently, U.S. scientists have discovered that their grant applications, which are considered to be privileged documents, can be inspected under the U.S. Freedom of Information Act. What is to keep an enterprising company or scientist form using this accessed to grant proposals to scavenge new ideas?

It is tough enough for scientists to live with the competition for jobs and promotions. But now with the potential rewards of very substantial profits for research, we are being taken to a new level of potential mischief.

Globe and Mail July 18/87.

SEE SENATE NEWS PAGE 6

# Canucks in Space

**By Morgan Burke**

Space. It is the final frontier to the romantics among us, but to those who make it their business, it is nothing more than a hostile environment rifed with colossal budgets. Until recently, the luxury of space exploration and exploitation had been reserved for the superpowers, while the rest of us in the financial and technological boonies could do nothing but watch and mumble jealously.

In the last decade or so this has begun to change, as more and more nations have realized that space is not the superpowers' private playground. More than a dozen countries now have active space programs, and space science and technology is gradually becoming the international enterprise it should be.

Early space exploration was actually a form of military research. Our modern day nuclear missiles are direct descendants of the early rockets which launched the Sputniks and Geminis. The great "Space Race" was not for anything so mundane and useless as collecting rocks on the moon, but for the technology and appliances to detonate atomic devices anywhere on the planet one cared to. Public and governmental support, however, would be guaranteed only if national pride and eternal glory were given as the primary objectives. Nuclear missiles may have been a heavy price to pay for space launch vehicles, but the deed has been done, and it is difficult to say what state space technology would be in today if it weren't so.

Things are somewhat different today. Civilian organizations are in control of most space agencies, and genuine research, exploration, and development are the primary objectives. This is the environment which makes space science available to more and more nations all the time. In 1967, the Canadian Space Agency was first proposed (though not actually created), and since then Canada has produced communications satellites, Canadarm, and various space-based imaging systems. We presently stand poised on the verge of a new era, both in Canadian space technology, and in space science in general.

The Canadian Space Agency is about to become a reality, some twenty years after it was first proposed. But better late than never, right? So why should space technology get this sudden boost, in a time of NRC cutbacks and general disregard for Canadian scientists? Well, aside from the increasing number of home-grown space projects, Canada has been invited to participate in two of the greatest endeavors in human history, and not coincidentally they both involve outer space. Each of these is being administered by one of the superpowers, and it is a testament to the modern spirit of international cooperation and/or the tremendous financial costs that other nations are being invited to join with them.

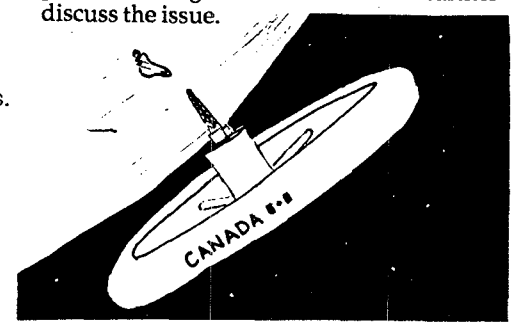
The first project will involve working with the United States on NASA's proposed space station. NASA's objective is to create a permanently manned orbital laboratory/launch platform in the manner of an Antarctic research base. A crew of half a dozen or more would occupy the modular structure in shifts of three months or so, performing duties pertinent to their objectives, be they research, development, or maintenance. Such a station would not only provide a unique laboratory, but also a base from which to conduct spacecraft launches and repairs. This latter task is what has been given to the Canadians: the design and construction of a "space garage", one of the station's four to six proposed modules. Such a facility, armed with a phalanx of Canadarms and other exotic tools, would be used for repair and construction of space vehicles and satellites.

The second project would involve working with the Soviet Union, a prospect some find fascinating for its political consequences. Others see it for an opportunity to get involved with the world's most successful and advanced space program. And still others care nothing for these matters, and are enchanted only by the proposed mission: Mars. The best launch windows for a human mission to Mars will arrive in the first few years of the twenty-first century, and preparation must begin now if anyone is going to make it. NASA toyed with the idea earlier in the decade, but now must view it as impossible with its program in a shambles following the Challenger disaster two years ago, to the week. The Soviets have been thinking of Mars for some time now, according to rumor, and their much-publicized research into long-term biological effects of weightlessness bears this out (it is estimated that astronauts on a Mars mission would be gone from Earth for two to three years). Their recent invitation of Canada to join them at last has confirmed that Mars is a Soviet goal of the next century. The USSR has also invited Canada to participate in some of the more "mundane" aspects of its space program, including building imaging systems, experimentation aboard the Soviet space station (smaller than NASA's, but hey, it's up there and NASA's isn't), and perhaps even contributing a Canadian astronaut to a future Soviet space mission.

While it is pleasing to know that space science transcends political boundaries, it must be acknowledged that manned space missions are the sole territory of the USA and USSR. This reliance may one day be shaken, but for the present we can consider the question: could Canada develop its own space launch capability in the next few decades? It is the opinion of this author that it is entirely possible, though not necessarily economically feasible in the present funding climate. Nations such as China, Japan, France, and India have developed their own space launch vehicles in response to the superpower monopoly, and there is no reason why Canada could not (come on, if India can...).
Unfortunately, many Canadians mistakenly feel that home-grown technology is second-rate, and that we are better off relying on the Americans for such major things as launches (one need only look at the present state of NASA's launch program to see the fallacy in this). Another unfortunate truism is that Canada has a tradition of mauling its aerospace industry: witness the Avro Arrow, and the recent sale of de Havilland Canada to Boeing, which also was once a Canadian company. Space rocketry is not as expensive and complex as space shuttle engineers would have you believe, but, although few expect to see it, Canadian rockets would do a lot towards revitalizing Canadian aerospace technology.

Canada accepted the American invitation to participate on the NASA space station, but has since put the project on hold, pending the confirmation of a military presence on the station. If the U.S. Department of Defense (nee War Department) gets its foot in the door, it will spell the end of not only Canadian involvement, but also that of the European Space Agency which has several neutral nation members. The withdrawal of so many participating nations and their funds would spell the end of the present incarnation of the project. It would be tragic if the American generals kill the space station by insisting on using it for an SDI platform, all the more so, since it would also mean the disappearance of an international space-based research facility, a loss which cannot be measured in dollars alone.

As yet, Canadian authorities have not announced a commitment to participate with the Soviets in space. The two nations have met and discussed collaboration, and plan to meet again within months to further discuss the issue.




# Exercise Your Right to Vote

by Todd Ablett -SUS President

You have now seen 5000 different posters with people telling you to vote for them. What are they running for?

The first election takes place from Wednesday to Friday, Jan.20 to 22. for the student representation on the Board of Governors (BOG) and the Senate.

The Board of Governors is the main decision making body of the university and is made up of 15 people; 8 are appointed by the provincial government and the remaining 7 from the university. Of the 7, 2 are elected from the student body and at present, 7 candidates have applied.

The Senate is the body that governs all academic matters of the university. There are positions from faculties and several positions that are elected from the student body at large.

The next series of elections is Wednesday to Friday, Jan.27 to 29 for the AMS Executive. The AMS (Alma Mater Society) is the student government for all students here at UBC and this body is made up of representatives from the various faculties and executives. This executive consists of a President, a Vice-president, a Director of Finance, a Director of Administration and a Director of External Affairs. This group will be elected by you during part of Science Week.

The voting times are from 8:30 to 4:30, Wednesday to Friday, at several locations around campus including the War Memorial Gym, Woodward Library, Computer Science, Scarfe and SUB. If you are interested in being a pollster ($3.00/hour) between classes, phone 228-2361 or drop by SUB Rm. 246.

It is your option not to vote, but please don't complain about the ones elected. Instead, make an educated choice and vote. It's your democratic right.

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Subscriptions are encouraged. Twelve issues: $7. Make money order or certified cheque payable to the 'SUS'.

ADVERTISING:

| | |
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| 1/4 page | $75 |
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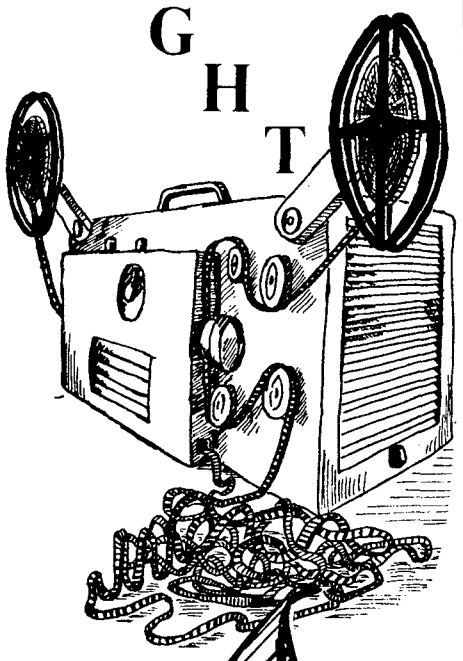
# MOVIE NIGHT



Paper Airplane Contest

Rules and Regulations

*Format, Scoring, and Prizes*

1. The contest consists of two categories; open and closed.

2. Each category will include three events: accuracy, distance, and time of flight.

3. Points will be awarded for each event and prizes given for best aircraft in each event and overall champion in each category.

4. Any contestant can enter one aircraft in each category. Changes to the aircraft between events are illegal and will result in disqualification of the participant from the category.

*Open Category Regulations*

1. Any paper product (paper, cardboard, etc.) is allowed in the aircraft.

2. Adhesives, such as string, glue, or tape are allowed for structural purposes only. Glue or tape used as weights or for any purpose other than holding pieces together will result in disqualification of the aircraft.

3. No metals, woods, or other non-paper products are allowed in the aircraft. (no rubber bands)

4. The aircraft number should be prominently displayed on the aircraft.

5. Painting or decorating of the aircraft is encouraged and bonus points towards overall champion or prizes may be awarded to deserving aircraft based on the opinion of the judges.

6. Decisions of the judges for aircraft eligibility are final and no appeals will be considered.

7. Back up aircraft may be used to replace disqualified aircraft before competition begins but only one aircraft is allowed in the competition per entrant, for all three events.

*Closed Category Regulations*

1. The aircraft consists of one 8.5 by 11 inch piece of paper.

2. The paper may be torn, but not cut and no adhesives are allowed.

3. The entire piece of paper must be included in the aircraft and the aircraft must complete the competition without falling apart.

4. Entrants will be provided with an official piece of paper at the beginning of the competition and allowed 5 minutes to construct their aircraft.

5. The aircraft number must be entirely visible without disassembling the aircraft.

6. The official logo must be partially visible and recognizable as such without disassembling the aircraft.

7. Decisions of the judges as to eligibility are final. Changes to the aircraft are allowed only during the initial 5 minute building time.

*The Accuracy Event*

1. Contestants will be allowed a certain number of launches of two bull's eyes.

2. Points will be awarded for aircraft stopping in the bull's eye.

3. Bonus points and certificates will be awarded to all contestants who succeed in hitting the guest "targets" in the centre of the bull's eyes.

4. The launch site is located at a higher altitude than the target.

*Distance Event*

1. Points will be awarded for the distance an aircraft flies in a given direction.

2. The aircraft must land within given sidelines.

3. Striking walls of ceilings disqualifies a flight. This applies to all three events.

4. The ground below the flight will slope up and away from the launch site.

*Time of Flight Event*

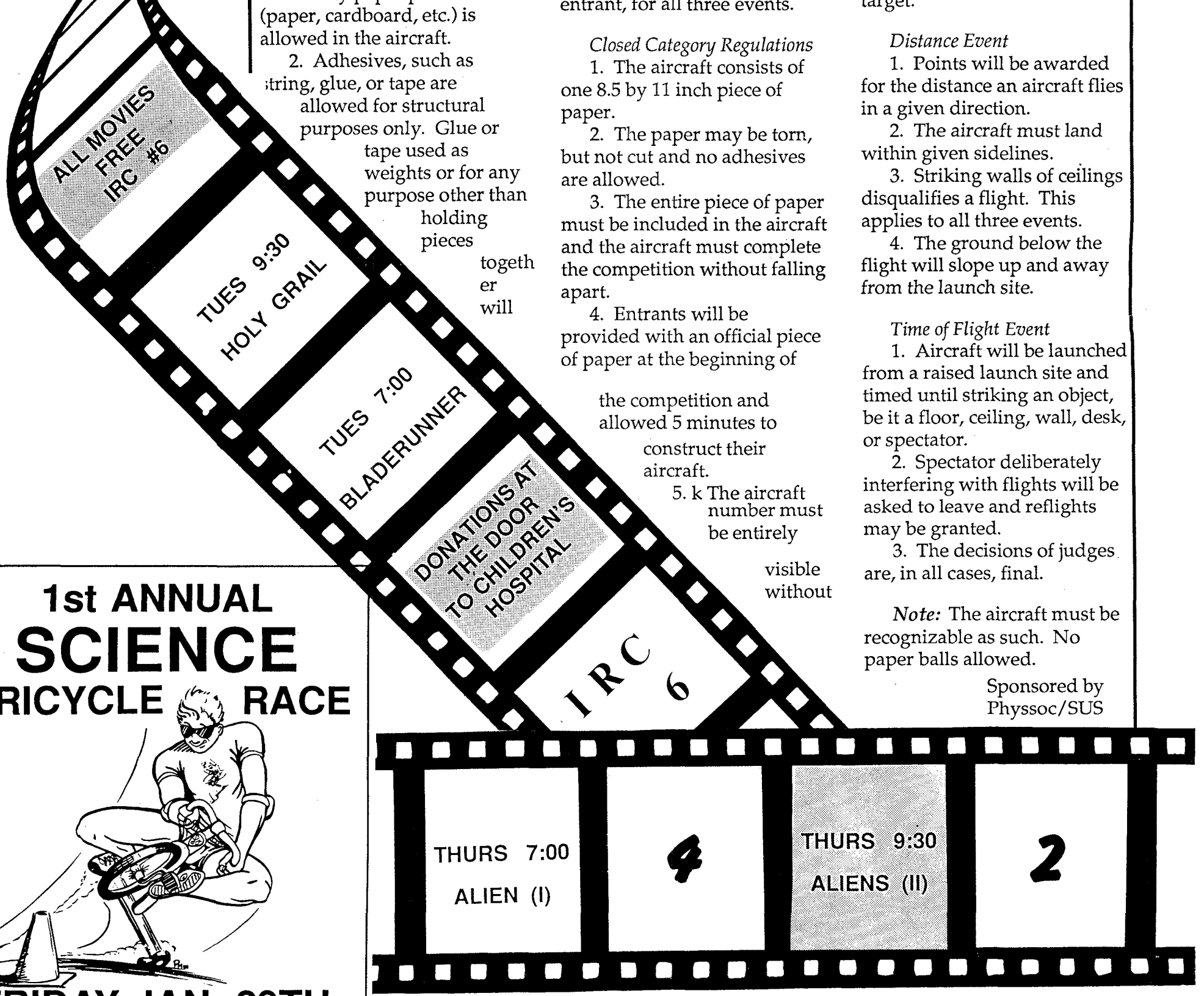
1. Aircraft will be launched from a raised launch site and timed until striking an object, be it a floor, ceiling, wall, desk, or spectator.

2. Spectator deliberately interfering with flights will be asked to leave and reflights may be granted.

3. The decisions of judges are, in all cases, final.

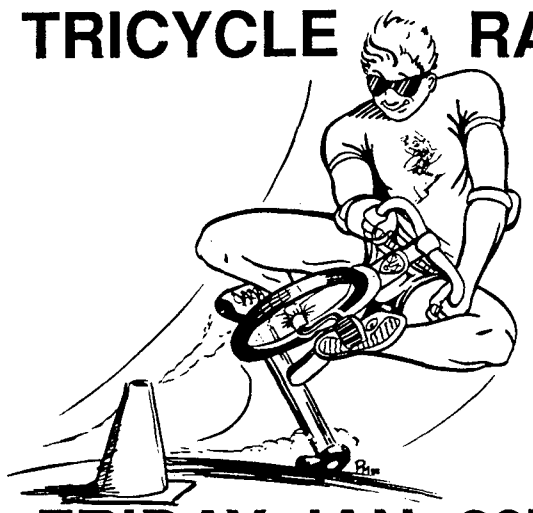
*Note:* The aircraft must be recognizable as such. No paper balls allowed.

Sponsored by Physsoc/SUS




DEPARTMENTAL DISPLAYS – SUB Concourse, Monday and Tuesday 10:00 am to 2:00 pm

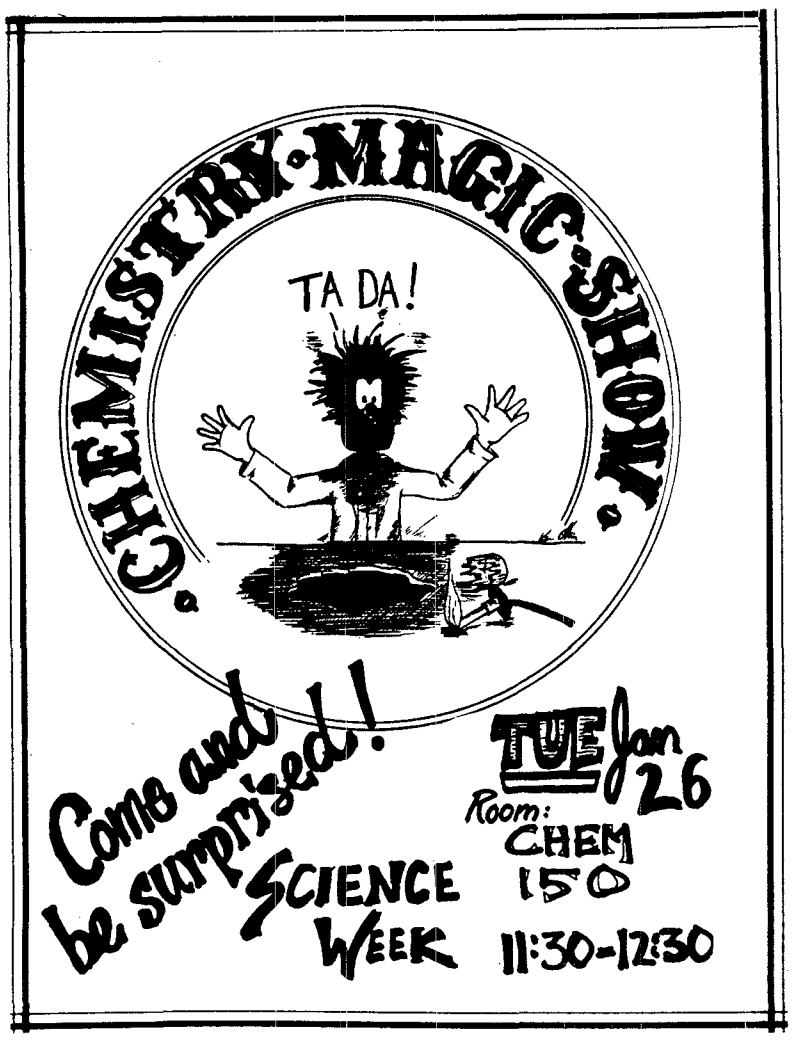
## 1st ANNUAL SCIENCE TRICYCLE RACE



**FRIDAY JAN. 29TH**

**12:30 - 1:30** SUB PLAZA

**TEAM OF 6: 4 undergrads, 1 grad, 1 prof (lecturer or staff)**
**COST: $30 per team - each team member receives an event t-shirt**
**REGISTER AT SCARFE room 9 (228-4235) Jan 18-27**





U.B.C. S.U.B.
LOUNGE, TABLES AREA AND ROOM 213
6138 STUDENT UNION BOULEVARD

WEDNESDAY, JANUARY 27, 1988 10:00 - 4:00
THURSDAY, JANUARY 28, 1988 10:00 - 4:00
FRIDAY, JANUARY 29, 1988 10:00 - 4:00

Co-sponsor: Science Undergraduate Society

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SUPPORT RED CROSS SERVICES WITH A DONATION TO UNITED WAY

Car Rally

*WHAT IS IT?*
Annually, groups of half-crazed science students jump into their cars and race around the city (in an attempt to follow a route given) in hopes of winning great prizes.

*WHEN IS IT?*
It's on January 27th (Wed.) and begins at 6:00pm.

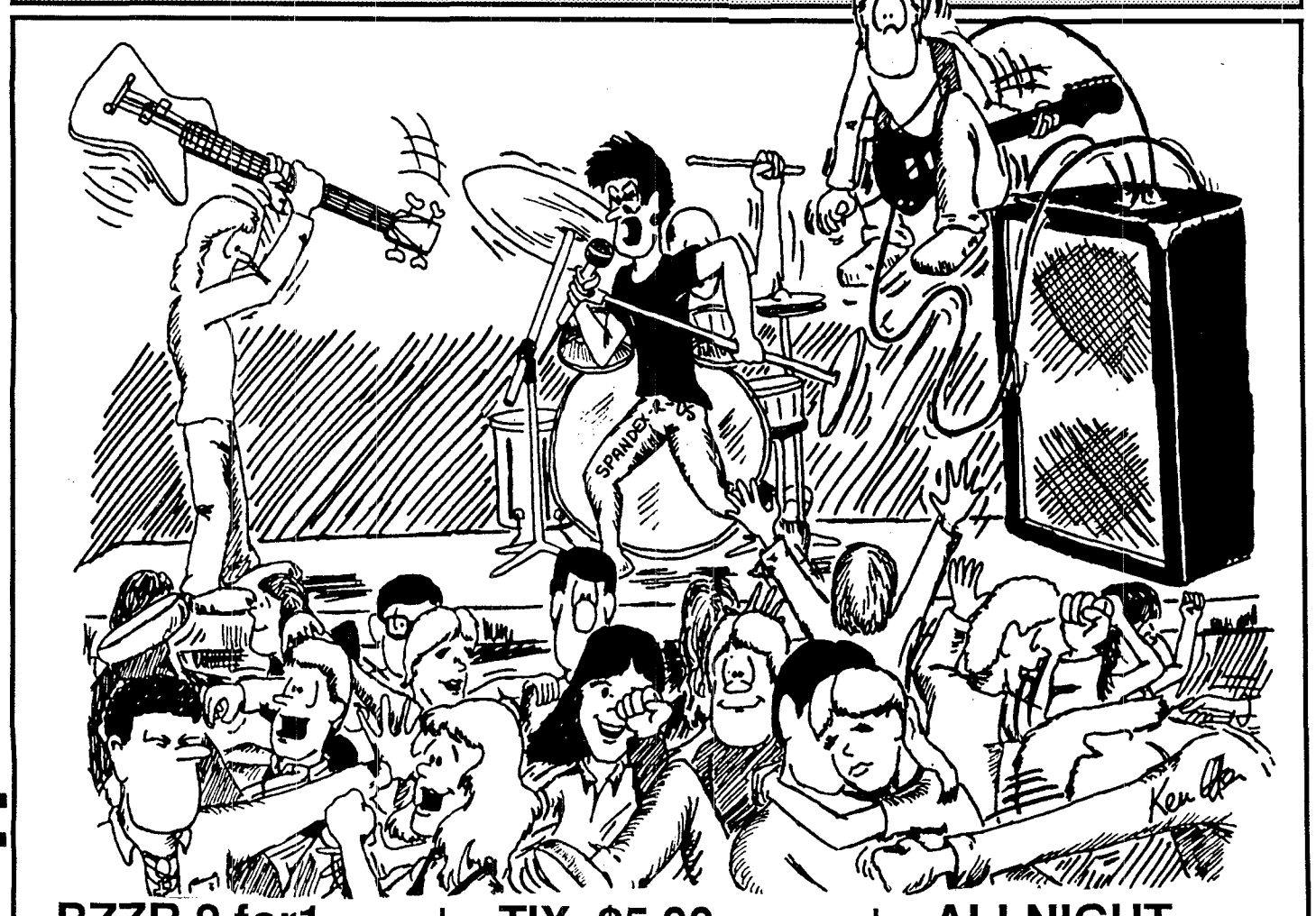
*WHO CAN ENTER?*
Any group of 2 to 4 Science students with a car.
No experience is necessary!

*WHAT CAN I WIN?*
$400 worth of great prizes available to be won.

*HOW MUCH DOES IT COST TO ENTER?*
Nothing - Zip - Zilch - Zero - It's FREE!

*WHERE DO I REGISTER?*
1) SUS Office-Scarfe 9
2) Computer Science Club Office-CSCI 203A

# FRIDAY JAN 29




**BZZR 2 for1 TILL 8.30**

**TIX $5.00 Ticket centre or SCARFE 9**

**ALLNIGHT BZZR = 1.00 HBALL = 1.50**

## DANCE TO THE BEAT of WALLSTREET

# CAR RALLY

Car Rally Rules and Regulations

1) The rally will be held on Wednesday, January 27 at 6:00 pm. Contestants must meet in Room 203 of the Computer Science Building to receive instruction.

2) The rally will start and finish at UBC. It will take approximately 2.5 hours to complete the rally.

3) Teams will consist of 2 to 4 people with each team supplying their own vehicle. Everyone that participates must be a member of the Science Undergraduate Society.

4) Over $400 in prizes will be awarded to the top teams; based on the ranking of the teams.

5) Speed is not the basis of ranking in this rally. Each team will be given a set of instructions which will direct them along a predetermined route. Along the way, you will be asked to identify certain objects or pick up various items. Points will be awarded for each correct answer and for arriving at the finish line closest to the time we have determined as the "approximate average route time".

6) The starting time for each car will be assigned on race day. It is up to the the team members to ensure that the automobile and the other team members arrive at your given starting time.

7) It is highly recommended that you bring the following items: a map, a flashlight, a reptile (or reasonable facsimile) and at least one quarter.

# BUNSI

**by Derek K. Miller**

Someone listened to me. I wrote an article (Issue #7) about the insidious ploy by food services to addict UBC students to cinnamon buns and the powers that be realized the grave nature of the situation and have taken steps to alleviate it - unfortunately in the wrong direction.

Like cigarettes and alcohol, cinnamon buns are perfectly legal. It would take years of legal hassles, appeals, and countersuits to ban them, so the administration has taken a more direct approach: they've upped the price. A new federal tax (appelated the Bun Legality Overdistribution Tax, or BLOT) has been applied to the carbohydrate concoctions; raising the price from 75 cents to 85.

I must, of course, cry out against this draconian piece of restrictive legislation. Not only does it fly in the face of the Charter of Rights and all that is morally decent in this country, but it also prevents any student from getting a quarter back, after paying for the bun with a dollar, to open the B-lot exit gates. It's the principle, you see.

In addition, those who are already addicted will be forced to pay the higher price, leaving less in their pockets to pay for expensive bunaholism treatments and designer sunglasses. It is a new urban tragedy that those who inflict these measures upon us do not see the consequences of their actions.

The impact on the bun market will probably be minimal. For any large-scale decrease in sales to be evident, a price jump of four or five hundred percent would be necessary. I urge those responsible for this abomination to bring the price back down so that those of us who need the buns can get them cheaply, and those of us who are smart enough to stop can do so without having to lend quarters to addicts.

Yes, I did eat a cinnamon bun today and I can stop anytime I want to. Honest.

## Senate News

**by Andrew Colbeck - Senator**

Botany and Zoology are being consolidated into one Biology department, with majors and honors in seven options: Animal Biology, Cell and Developmental Biology, Ecology, General Biology, Genetics, Marine Biology, and Plant Biology. As a result, the course numbering system is being revamped totally.

Oceanography has been added to the General Science program list of options under the Life Sciences section.

Atmospheric Science is now offered jointly by the Geography and Oceanography departments, with a diploma in meteorology.

A change in the Science section of the calendar has been made; it reads as follows: "Students should obtain better than the minimum passing mark in each of Physics 213, 215 and 216 to enroll as a Physics majors". Presently, sixty percent is required in a first year Physics course to take these courses in the second year.

New money! Scholarships and bursaries are still being offered regularly to keeping in step with fee increases and governmental lack of student support (that's different from their *University* support). In the Sciences, new scholarships totaling $2000 and new bursaries available to Science students total $1550.

The next meeting of Senate will be February 17th.

**S E N A T E  N E W S**

Do you have any photos worth publishing? The 432 will print them in the February 24th issue of the paper. This is your chance to show everybody the 'shutterbug' in you. Prizes may even be awarded for the best three entries. Photos will be returned and credits will be given.

Please put your name and phone number on the back of each photo submitted. Color as well as black and white photos will be accepted. The deadline is Wednesday, February 17, 4:30pm. So get those cameras out and make those shots count!

Sponsored by Lens & Shutter
Prizes:1st prize, Bushnell Binoculars
2nd prize, Fuji Film ($25)
3rd prize, Fuji Film ($15)

Lens & Shutter

## Ticket Deal with the Vancouver Canucks

Science is selling tickets to two Canucks games during February for a very special price. On Saturday, February 13th, Science students will have the opportunity to watch the Canucks battle the Boston Bruins for only $12 a ticket. These seats are usually sold for $21 but we are able to offer them to you at a 40% saving.

This deal also applies to the Friday, February 26th game against the Calgary Flames. This is a limited time offer and tickets are available from the Science office in Scarfe 9 until January 29 only.

For every 25 tickets sold, Science can enter 1 person in the Canucks/Rowntree Shoot-Out Contest. The winner of the Grand Final Shootout receives air fare for two to Hawaii plus $1000 spending money. The contestants will stand on a mat between the face-off circles directly in front of the goal and shooters will have 5 shots each at a "Shooter Tutor". Points will be awarded for each successful shot and the highest score wins. For more details, come to Scarfe 9.



## Treasurer's Hours

MONDAY12:30-1:30
TUESDAY 1:30-2:30
FRIDAY1230-1:30

## Wanted

(preferably alive)
Typists
Writers
Illustrators
Layout Person
Ad Manager

## CANUCKS VS BRUINS

Saturday, February 13th 5:00 pm
Special price: $12
Save over 40% regular season price of $21
This is a limited time offer.
Tickets available at the Science office, Scarfe 9.
Until January 29 only.

Attn: All Graduating Physics Students
Deadline for grad photos for the composite is February 15th.
Phone Artona Studios at 736-7281 for an appointment.
- Day and evening sittings available
- When getting your pictures done, identify yourself as UBC Physics, Class of '88.

For more information, contact Jan or Margaret in Henn 307, or phone Artona.

# ADS

Pedal Pusher Sick?
I'll come to your home to administrate necessary treatment. Approximately 1/2 the shop rates. Experienced. Call Philippe at 731-2638. Evenings and weekends.

Honda CRX top hatch spoiler; fits on the hatch behind sunroof. Complete with CRX lettering. Retail $190. Sell $100. Call Albert, 873-5805.

Yamaha collectible. 6-string acoustic. Beautiful neck - thin & fast. $150. Hans (Totem Park Res.) 224-9037.

The Jam: 100 copies of collectible prints (Rock n' Roll Classics) available on the West Coast for $15 each. Come for a viewing: Totem Park Res, 209 Shu. 224-9037.

I, Robert Stephen Armstrong, wish to claim my beloved bush-hat and cherished scarfe which I lost while being a pain in the ***.

UBC Toastmasters Host
Inter-University Student Speech contest. Sub Auditorium, Thursday, February 4, at 12:30.
FREE entertainment/door-prizes.
SFU, BCIT and UBC present.

Beynon Runs for Board of Governors: "If students understand the issues, they can make up their own minds." Beynon said that he could reach students through the Ubyssey, club and faculty newsletters and person-to-person meetings.

Pre-Med Society: Field Trip to Sports Medicine Clinic
Thursday, Jan. 28, 12:30-2:30. Meet at IRC G-30.



PHYSICS
U B C

PART-TIME PHYSICS POSITION OPEN

LAB ASSISTANT/TECHNICIAN
JANUARY through APRIL 1988

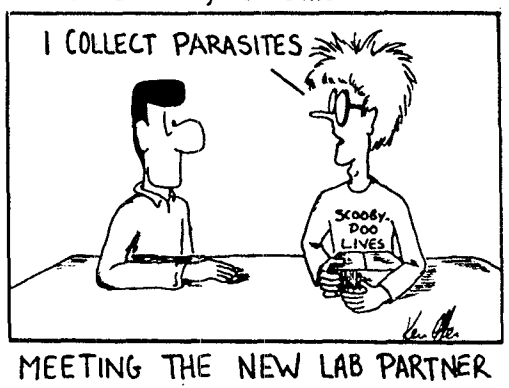
Columbia College (Burnaby) requires a part time lab assistant/technician in their physics department.

*Duties involve:*
1) Maintaining, repair and ordering of physics lab equipment.
2) Assisting in the preparation of a lab manual.
3) Developing new physics lab experiments using computers and A/D and D/A converters.

*Qualifications:*
1) One or more years of university level physics courses.
2) Experience using personal computers.
3) An ability to type and make sketches and line drawings.
4) Experience using simple hand and power tools.
5) Experience building "kit-type" electronic circuits.

*Time required:* 8 hours per week
*Salary:* $300 per month
*Contact:* Dr. Dan Phelps, Columbia College, 277-9195.

I.N. STEIN by ken Ottter




MEETING THE NEW LAB PARTNER

# C.L.A.W.S

**by Michael Dean & Kyle Robert Kirkwood**

With the turn of the magic knob, a white dot becomes an amazingly clear picture of a beautiful woman in a deep blue blazer. On her lapel is a badge which reads UBS, United Broadcasting Corp. The picture comes to you in your home and you listen as she speaks.
"Welcome. Tonight a special report on a very serious problem: the Cat/Elephant Crisis. Reports from both Africa and Asia claim that elephants are being attacked and eaten by great mobs of ordinary house cats. These feline delinquents prowl during the night, sneak up on poor unsuspecting pachyderms and rip them to shreds."
"We at the UBS news department first reported last week's disappearance of Fufu, the two tonne baby elephant from the Spuzzum Zoo. Her remains were found today stuffed into forty-three cans of Dogpo. Foul play is suspected and belief is that the pacydermicide has spread from Asia and Africa to North America. Local police stations are swamped with reports of missing elephants."
"Dr. Emmanuel Keezer, head of the Royal Canadian Centre for the Rehabilitation of Delinquent Pets, says that the problem appears to be one of diet."
The woman looks to the monitor, then disappears to be replaced by an older man with thick glasses and a large nose.
"Well, the nearest I can surmise is that somehow Felix domestica or the common pussy cat has undergone a dramatic change can turn the normal house cat into a raving elephant killer, and may explain both the extinction of other elephant species, such as mastadons, and very probably the dinosaurs 65 million years ago."
The woman returns.
"If your cat has been showing strange tendencies lately; filing his claws, hanging around strange places with strange cats or shunning his cat toys, your cat could be an elephant killer."
The woman fades from the screen but is quickly replaced by a man with plastic-looking hair. He lifts up a box, and begins his spiel.
"Is your cat bored? Does he throw-up his everyday cat food? Try NEW Kitty Krunchies! YES, your cat will love NEW Kitty Krunchies. They come in a variety of yummy flavors: small Furry Rodent Stew, Liver & Carrot Pate, Cheeseburger with real beef and two kinds of cheese, and our NEW Elephant flavors; Loxodont & Bagel and Curried Elephant Bits! Buy Kitty Krunchies today, and prevent projectile vomiting!"
Your telephone rings. You rise to answer it, turning down the volume as you go.
"I'll get it dear. Hello? What? Oh dear. What's he done? How much? All...all right, we"ll be right down. Thank you, good-bye." You hang up.
"Who was it dear?"
You answer, a little confused, "It was the police. They picked up Spunky!"
"What's that cat done now?"
"I don't know, something about attacking an elephant. C'mon let's go bail him out."
You arrive at the pound and agents of the special Police Cat Attachment are seen roaming the grounds. You are taken to Spunky and all appears fine or so you think.
"Oh, you naughty cat. I should thrash you good."
Spunky miaows, innocently.
Your spouse speaks. "I don't know what got into him, attacking a poor elephant like that."
"Naught Spunky! You little monster, you'll be sent to bed without any supper!"
"Who? Me!" Spunky's miaow seemed to say.
"Damn cat! We should have gotten something harmless, like a crocodile."
Your spouse is not pleased.
"Naught cat, and stop trying to make up." A sandpaper tongue catches you unaware. "Lick someone else for awhile. You must think I taste awfully good, mrrrph, right in the face." You are defeated. You scratch Spunky behind the ear.
Spunky miaows his pleasure in fast short burst which reminds you to buy more cat food.
Home again with the magic box. There is a man on the screen selling cat food; his plastic hair gleams under the stage lights. He holds up a box with "NEW" splashed across it.
"Is your cat tired of his old cat food? Tired of liver, fish, beef, elephant, mongoose, parakeet and all those other humdrum flavors? The try NEW human flavored cat food! That's right H-U-M-A-N FLAVORED! It comes in these wonderful flavors: Seasoned Siberian, Noodles & Cantonese, British Crumpet, Turkish Delight, Arabian Nectar, French Canadian on Toast, Eskimo pie, Canadian and Back Bacon and many more soon to be released flavors..."
"Well, I certainly don't like that, change the channel will you dear."
Your spouse gets up and changes the channel on the magic box. The lady in the blue blazer isn't anywhere to be found. Your mate quickly flips through the channels a second, then a third time and finally she remarks: "There's nothing on but cats!"
You hear your cat miaow, for the very last time.

# SCIENCE CALENDER

## INTRAMURAL REBATES

**by Stella Wong – Sports Coordinator**

If you've competed in an Intramural event for Science in the first term this year and haven't yet submitted a rebate request, please do so NOW! Requests for rebates (with the exception of **league sports**) must be submitted by February 15. Any requests for first term rebates will not be considered after that date. In order to receive your rebate, we require either:
1) a copy of your registration form and your receipt
or 2) a copy of the official results sheet (from Intramurals) and your receipt.
Requests can be dropped of at the office (Scarfe 9). If you have any questions, please see Stella or Gautam.

## SCIENCE IN SPORTS

**by Stella Wong -Sports Coordinator**

Science Sports is sorry to see one of our departmental sport reps leaving us in the new year. Unfortunately, **Bernard Lakowski,** will not be continuing as the Chemistry sport rep. He organized soccer for our Science teams and deserves congratulations for a job well done. We wish him success in his studies. The committee welcomes **Steven Turner** as the new Computer Science Sports Rep. He can be found in the CS3 office usually during 12:30-1:30 (MWF) or a message may be left for him in the Science office (Scarfe 9). Congratulations go to **Gautam Lohia,** the new Men's Sport Representative. His excellent organizational abilities will be an asset in his new position. He will continue as head of basketball for our Science teams and his office hours are Mondays and Wednesdays from 1:30-2:30.

Our Women's Division 1 basketball team, captained by **Cynde Scheck,** are the champions of the league. On December 2, they defeated Soccer in the final game. The team should fair well in this second term.
Our Women's Division 3 volleyball team, captained by **Bonnie Lee,** were also winners in the first term. **Louise Low** was recognized for her excellent playing skills.

Congratulations to everyone involved and continued success in the new year!

# SPORTS

## Special Events

THE CENTIPEDE CHAMPIONSHIPS.
Thursday, February 11 (12:30pm).
Registration: January 25-February 5.
Fee: $25/Women's team
$30/Men's team.

UBC TRIATHLON.
Sunday, March 6.
Registration: Jan. 11-February 12.
Fee: $30 (UBC & High School Participant)
$35 (Community Participant)

SPANISH BANKS DOWNHILL DERBY.
Sunday, February 28 (8:00am-)

## Co-Rec Sports

BROOMBALL BASH Part II.
Thursday, January 28.
Registration: January 11-22.
Fee: $25/team.

CURLING.
Thursday, February 11.
Registration: January 25-February 5.
Fee: $25/team.

INDOOR CRICKET.
Saturday, February 27.
Registration: February 8-17.
Fee: $15/team.

## Tournament

SUB 6 FT. BASKETBALL (Men & Women).
Friday and Saturday, January 29/30.
Registration January 11-22.
Fee: $30/team.

## Racquet Sports

PAN AMERICAN OPEN (Doubles).
January 29-30.
Registration: January 11-22.
Fee: $4/round

EUROPEAN OPEN.
February 26-27.
Registration: February 8-17.
Fee: $4/round

AUSTRALIAN OPEN (Doubles).
February 2-7.
Registration: January 18-29.
Fee: $4/tourney

US OPEN.
March 1-6.
Registration: Feb. 15-26.
Fee: $4/tourney

MARITIMES OPEN.
February 12-13.
Registration: January 25-February 5.
Fee: $10/tourney

## Runs

Fee: $10. Every participant receives a T-shirt.

FROSTBITE ROAD RUN (4/6.5 km).
Friday, January 29.
Registration: Jan 11-22.

TRIUMF ROAD RUN (3.8/5.2 km).
Friday, February 5.
Registration: Jan 18-29

VALENTINE'S SWEETHEART RUN (3/6.8 km).
Friday, February 12.
Registration: Jan. 25-Feb. 5

BOULEVARD ROAD RUN (3/6.8 km).
Friday, February 26.
Registration: Jan. 25-Feb. 5

**CALL OF THE WEEK**

In a basketball game on Sunday, January 17, head Intramurals referee Paul Bains made an astounding call. He gave Gautam Lohia, the men's sports rep, a technical for GLARING!!

# SEMINARS

**Thursday, January 21**
Dr. Henry Vaughan: Canadian Arctic Ships. Civil and Mechanical Engineering Building. Room 1215, 3:30pm.

Dr. Wilfred A. Jefferies: A Chimeric MHC Class I Antigen Function which Restricts Virus Specific Cytotoxic T-lympho-cytes in Transgenic Mice. Woodward. Lecture Hall #3, 4:00pm.

Dr. M. Bloom: Evolution of Membranes. Hennings Building. Room 201, 4:00pm.

**Monday, January 25**
Dr. G. Walker: Things that Go Bump in the Night: Stellar Non-radial Pulsations. Geophysics and Astronomy Building. Room 260, 4:00pm.

**Tuesday, January 26**
Dr. Anthony Merer: High Resolution Laser Spectroscopy of Metal-Containing Radicals. Chemistry Building. Room 250, 1:00pm.

D'Ann Rochon: Genome Structure of Two Isometric Plant RNA Viruses. Biological Science Building. Room 2000, 12:30pm.

Dr. James Kronstad: Isolation of Metabolic and Pathogenicity Genes from the Corn Smut Fungus Ustilago Maydis. Biological Sciences Building. Room 2000, 4:00pm.

Dr. Madelaine Cahill: Edge Waves off the Coast of Sydney, New South Wales. Biological Sciences Building. Room 1465, 3:30pm.

Dr. San Dor: Cardiology. Woodward. Lecture Hall #1, 12:30pm.

Dr. T. Pederson: Glacial Carbon-rich Sediments in the Eastern Pacific: Productivity or Preservation. Geological Sciences Centre. Room 1465, 3:30pm.

**Thursday, January 28**
Dr. B. Brett Finlay: Transcytosis of Salmonella through a polarized epithelial monolayer. Woodward, Lecture Hall #3, 4:00pm.

Dr. E. Fradkin: Anomalies in Condensed Matter Physics. Hennings Building. Room 201, 4:00pm.

**Monday, February 1**
Dr. W. Hulbert: Mechanisms of Acute Airway Injury and Cellular Exfoliation.

**Tuesday, February 2**
Dr. Linda J.C. Love: Luminescence and Chromatography in Organized Media. Chemistry Building. Room 250, 1:00pm.

Dr. Tony Warren: The Cellulase System of Cellulomonas fimi; characterization of its genes and proteins. Biological Sciences Building. Room 2000, 12:30pm.

Dr. E.D. Cokelet: The Annual Mean Circulation and Refluxing in Puget Sound. Biological Sciences Building. Room 1465, 3:30pm.

**Thursday, February 4**
Dr. B. Goldstein: Aggregation and the Physics of Cell Surface Receptors. Hennings Building. Room 201, 4:00pm.

**Tuesday, February 9**
Dr. Dallas L. Rabenstein: Bioanalytical NMR Spectroscopy. Chemistry Building. Room 250, 1:00pm.

Dr. Doreen DeMason: Physiological and Developmental Aspects of Palm Seed Germination. Biological Sciences Building. Room 2000, 12:30pm.

Dr. D. Levy: The Significance of Fish Diel Vertical Migrations: New Theory and Field Tests. Biological Sciences Building. Room 1465, 3:30pm.