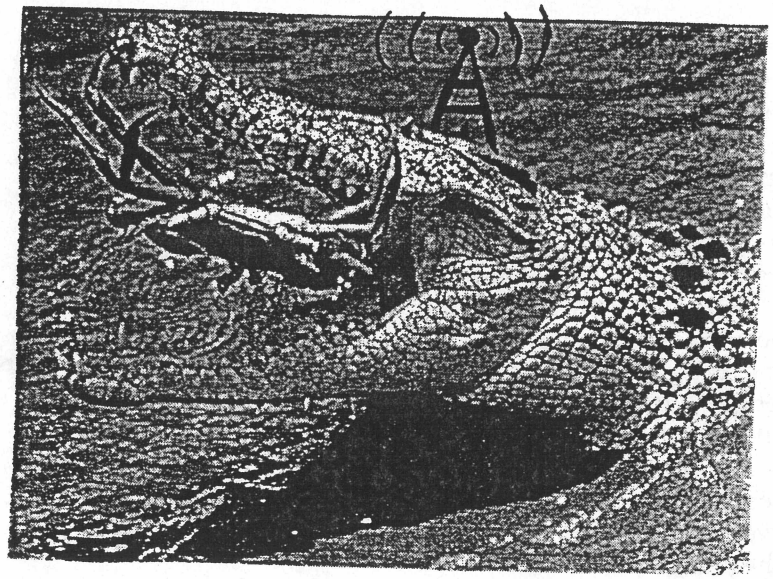
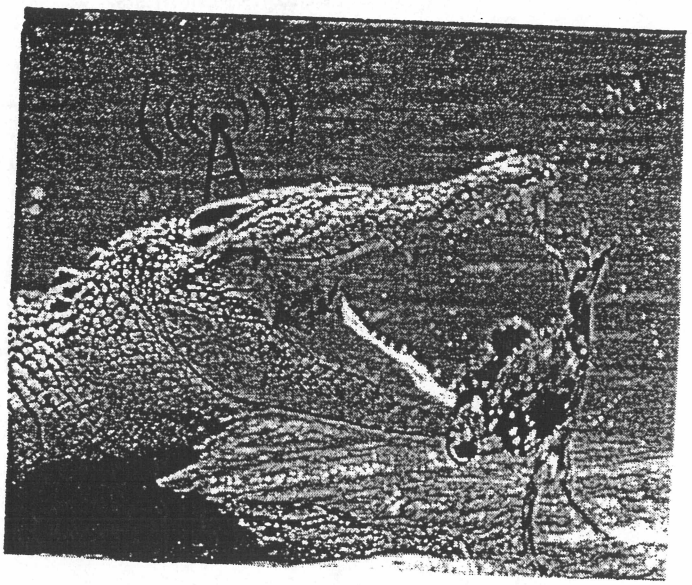
Journal of Physoc, the Sydney University Physics Society.



Jeremy



Volume 17, Number 1, April 2000.

President's Report

G'Day loyal subjects,

Old King Fletch
Was a merry old wretch
And a merry old wretch was he.
He called for his wench
He told her to stretch

Her already pushed for time schedule & take over for him when he got caught embezzling large of beer from the last BBQ.

Or that's what should have happened ... Actually I narrowly defeated an inanimate carbon rod (by a whopping 2 votes) in a hard fought & entirely democratic election. Anyway, here I am, ready to lead us all in the fight for truth, beer and the scientific way.

Jeremy is an occasional tri-monthly publication of the physics society. Back in the Messel era, or at least before I knew that when I grew up I wanted to be one of the scientists on Days of Our Lives, Jeremy was first spawned. Well, why not. "Ralph" is already taken.

There is no such thing as a cool physicist. Though we try to be hip, the minute we bring up Heisenberg's uncertainty principle over a game of pool the stigma of science is upon us. I often wondered why. After surfing between Dawson's Creek and Adam Spencer on Quantum last Thursday I realised why. Just try it. I know you'll understand.

Meanwhile enjoy Jeremy. If you run out of stuff to read during your lecture, listen. Pop any funny quotations that your lecturers might say in our mailbox in Elizabeth Hing's office (along with your name & email) and we'll publish them. PLUS you'll be in the running to win our quotes competition at the end of the year.

May the grand unified electroweak/strong/gravitational force be with you.

Jocelyn R.

Errata

In the final issue last year, we published the following quote from Tim Bedding:

"I never did like chemists."

The quote should have read

"I never did like chemistry."

The Jeremy editors apologise for the error and any embarrassment resulting to Dr. Bedding. We'll try to get it right this year.

- Chris Barton, Edward Boyce, Amy Dickings and Kiran Krishna.

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WE REACH BUYERS NATIONWIDE, STATEWIDE & INTERNATIONALLY

An Alternative to relativity

Kiran Krishna

As a species, it seems that we humans need unquestionable truths. While it might seem that everything is being brought to question by the new physics, the new physics itself might be gradually slipping into the role of just a 'truth'. While there might be plenty of people who might not understand relativity, there are very few people that question its validity, at least from a rigorous scientific point of view. There is a tendency to consider those who do so as cranks. However, there are theories that do offer reasonable alternatives to relativity and until proven wrong they should be talked and thought about as they might offer important insights into the nature of the universe. One such theory is Ritzian Mechanics.

Ritz in the early decades of this century developed Ritzian Mechanics from Maxwell's theory of electromagnetic radiation to explain a few observed differences from theoretical predictions in a similarly how relativity developed. Let us consider how relativity was derived.

The Origins of relativity

When electricity was first discovered, four new effects had to be explained.

1) The force between two wires carrying current.
2) The observation of voltage generated by changing current in a wire.
3) The radiation of energy from an oscillating charge (radio waves).
4) The effect of current in a wire on a single electric charge.

James Clerk Maxwell came up with a theory that explained al of these results that relied on the idea that an electric current generated a magnetic field, which could act either on conventional magnets or on other currents in a wire. It could also act on individual charges causing the last mentioned force (called a Lorentz force). A changing electric field could also generate a magnetic field, which could then move charges causing electricity. Maxwell explained radio waves by the reverse effect of a changing magnetic field generating an electric field. There were a few other problems:

1) Light had been observed to have a fixed velocity regardless of the velocity of the source.
2) The forces between magnetic fields and charges were not always reciprocal, thus contradicting Newton's third law. Imagine a moving electromagnet and a stationary charge.

The changing magnetic field exerts a force on the charge, but this doesn't move and doesn't generate an electric field. There would thus be no force on the electromagnet. However, an electromagnet will exert a force on a moving charge, which will then generate a magnetic field, which exerts a force on the electromagnet. An experiment called the Trouton-Noble experiment concluded that a stationary charge next to a moving electromagnet does generate a magnetic field, which acts on the electromagnet.

The first of the above contradictions led to the development of Lorentz contraction and the second was resolved by applying the Lorentz transformations to the electric field generated by the charges. At this stage however, the Lorentz transforms were unjustified fudges. Then, Einstein found by assuming that the speed of light was always constant no matter how you were moving you could explain all observed facts. However, Relativity went on to say that mass dilation and time dilation occurred for objects in motion. This explained a diminishing acceleration in certain conditions and a decline in populations of high-speed sub-atomic particles.

Ritzian Mechanics

Maxwell's results are quite useful in dealing with most problems in day-to-day life and this was held to be a validation of this theory. However, it also incorporated an absolute reference frame (ether) and predicted that non-reciprocal force would sometimes occur. It also had difficulties explaining known facts about the propogation of light.

Einstein resolved this contradiction as explained. However, an alternative view was developed based around a modified Coulomb's Law. This was originally considered by Gauss, and various people (including Ritz) developed it further.

Consider for example a magnet generating a magnetic field that acts on other objects. If one were to consider the moving charges in the magnet as directly acting on other objects, we would then have to correct the force between them for the fact that the charges are moving. We then would have the same results as with a magnetic field. By incorporating the acceleration between two charges it was possible to incorporate the effects of a moving charge and hence transformer action. In 1967, Dr. Z.L. Budrikis showed that it was possible to derive faraday's law, the Lorentz force, Induced emf and Hertzian radiation from Ritz's fundamental relationships. Ritzian theory predicts a varying velocity of light between two isolated emitter and receiver pairs.

However, light does not just travel as a disturbance through the vacuum of space. It also travels as a disturbance in the medium through which it travels. It changes from a vacuum based to a medium based disturbance by a process called extinction. If light travels through a medium for a much larger distance than it travels through a vacuum, its velocity will be dominated by the material, and it will appear constant. Therefore, arguments about binary stars providing evidence for the constancy of the speed of light. Light is affected by the very thin gas, which is still present, which masks out any source-based effect on the emission velocity of light.

Experimentally, it is impossible to emit electrons from an electron gun at faster than the speed of light. This is explained by Relativity using mass increase. However, Ritzian mechanics explains this by predicting a decline in force-strength as their relative velocity approaches the speed of light. This is analogous to firing shells from a canon. We cannot fire them faster than the speed of sound in the high-temperature gaseous mixture behind the shell. Otherwise the gas would be unable to keep up with the shell and push it any harder. Ritzian theory proves that we are unable to push the electrons as hard as we approach the speed of light.

Another effect supposedly explained by relativity is population difference in sub-atomic particles from non-relativistic theoretical predictions, i.e. supposedly due to a time dilation, which means that the particles decay 'slower' because they decay at a certain rate based on 'their' time. Ritzian Mechanics explains it by assuming that decay is a function of fields it experiences and as a particle travels, the fields it experiences are smaller.

Faster than light travel?

Though it is impossible to accelerate anything faster than the speed of light using interacting electric fields, Ritzian mechanics says that we can accelerate to arbitrary speeds using rocket propulsion. For example, if we had a rocket (such as the recently proposed Dedalus) that fires atom bombs behind it, we could achieve this. That apart, Ritzian mechanics actually predicts particles resulting from the decay of others travelling at a speed close to that of light, to be ejected at a speed faster than that of light. Indeed, if such an experiment could be performed and were shown not to produce such decay fragments it would give proof against Ritzian Mechanics.

Conclusion

The point of this article has been to argue for a greater amount of questioning of what we take to be accepted principles. I find Ritzian mechanics hard to accept for precisely the reason that it hasn't explained observed effects of time and mass dilation or the principle of mass-energy equivalence to my satisfaction. I do think that it deserves more research, and that its proponents should be heard out before they are dismissed. My contribution to this article has been in terms of editing and changing some of the words in which the views it expresses have been expressed. The content of the article has been borrowed with permission from John August. More can be obtained from his site at: http://phaedra.apana.org.au:80/johna/ritz.html

Quotes by Lecturers and Students

"We are pathetic creatures living in a three dimensional space with two dimensional blackboards, but so be it."
"Aspect, unlike most of the physicists in this course, is still alive and kicking - he's not even bald."
"You should be doing this in your sleep. I know you may doing other things in your sleep, but this should be one of them."
"Commutators are the stuff of sweet dreams."
"It's déjà vu all over again."

- Dr. Martijn de Sterke

"Particles are very massless - almost."

- Dr. Michael Wheatland

"Unfortunately, Δs^2 is invariant between observers, but not between textbooks."
"Having looked at general relativity, we are now ready, as it were, to take on the universe."

- Dr. Gordon Robertson

"Anything goes in quantum mechanics."

- Prof. David McKenzie

"This stuff was done before most of you were born, which is always amusing."

- Dr. Iver Cairns

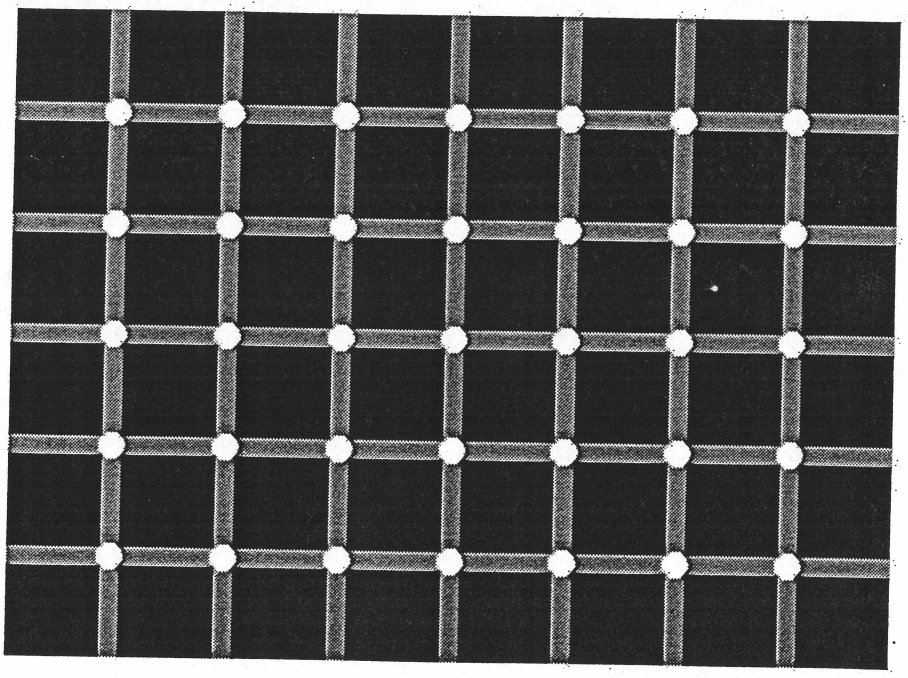
"No, but you can have a bigger infinity."

-Mark Hertzburg

"No. [Coffee] is not for you. You have to be a big girl before you get this. Another three months...."
- David Martin [to 18-day old Zoya Caitlin]

"Tim is a bad influence on [Tim]."

-Bradley Baetz



← Are the dots white or black?

School of Physics Anagrams

What's in a name? Plenty, if you're prepared to rearrange the letters. Here are some curious anagrams of prominent university people, places and experiments.

Professor Richard Edward Collins:
Sharper warlord finds crocodiles.
Horrific warlord dopes class nerd.

President Jocelyn Laurence:
Jolly cute creep, insane nerd.

Professor Donald Melrose:
Oops, some nerd flares lord.

Karl Kruzelnicki:
Crazier skull kink.

First Year Laboratories:
So for a beastlier rarity.
Array of beastlier riots.
O arise for able artistry!
Fiery star laboratories.
Erases foot arbitrarily.

Slade Lecture Theatre:
Result elated teacher.
Hate elated lecturers.
Latter schedule eater.
Alert! educate shelter.
Hate related lectures.
Ales decelerate truth.

Physics Tea Room:
I'm a psycho store.
Oh My! Space riots.
Choosy primates.
So hyper atomics.
Is empty or chaos.
Prime chaos toys.

Research Centre for Theoretical Astrophysics:
I rottenly scatter cheapish sorcerer arch-foes.
Nicely sharp, choicer, state-of-the-art sorcerers.

Air Shower Core Experiment:
Heroic extreme repairs now.
Hear nice, worrisome expert.

A Toroidal Lhc ApparatuS:
Lout liars approach data.
Stood a particular alpha.
Partial halo as a product.
Aha! cloud traitors appal.
Rat aid or alpha-plus coat.
Radio alpha-plus to a cart.

Sydney University Giant Air Shower Recorder:
Re: worthy, dreary , tin genius deviancies - Sorry!
Haywire rigidity ensnares rude controversy.
Tiny haywire dirtying sorcerer's endeavours.
Genius victory or yesterday's hardier winner?

Sydney University Particle Telescope:
Is lovely pest, creepy side uncertainty.
Retrospectively tiny, speedy lunacies.

Sydney University Stellar Interferometer:
I love sly starry-eyed interfere instrument.
Let's return formerly everyday intensities.
It is lovely, returns starry-eyed refinements.
Freely note virile starry-eyed instruments.
So rusty, retrieved really tiny refinements.
Loveliest starry-eyed instrument refinery.
Freely mentioned tiny terrestrial surveys.
Idle? Let's try tiny universe transformer eye.

Molonglo Observatory Synthesis Telescope:
Stealthy Cosmology Overtones Responsible.

- by Cow-Eyed Bard, Ah! Much Atoms and www.AnagramGenius.com.

Historical Feature

Have you ever wondered how student publications change over the years? For your amusement, we have reprinted the following page from the 1968 Sydney University Science Yearbook. Please note that the editors do not endorse any of the gender attitudes implied in the article (after all, we weren't even alive at the time). Many thanks to Dr. Cramer for providing the article, and to Assoc. Prof. Peak for being so cute.

Miss Science Cocktail Party

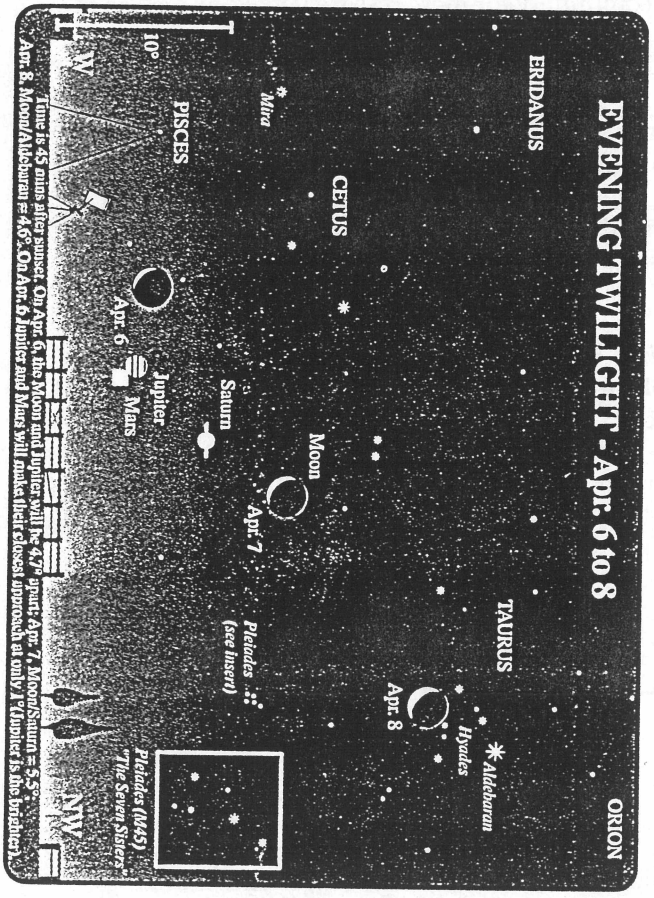
"The judges are happy" — Miss Pat Woodley, Dr. Lorrie Peak.

"No Comment."

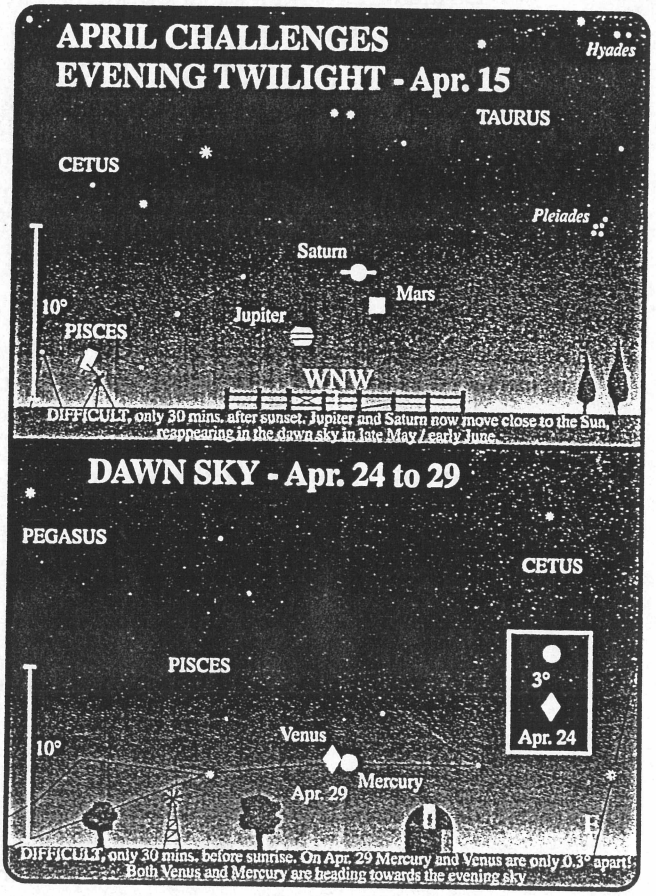
April Conjunctions

Studying any astronomy courses? Even if you're not, get out and have a look at one of nature's great shows. There are a few occasions this month when the planets will line up close together. All you'll need is a clear horizon, with no trees or buildings down low blocking the view, and clear weather (fingers crossed on that one). Then just use these maps to find the planets at the times indicated. Note that E, W, NW etc. stand for compass directions.

6:10 pm



6 pm (top) **6 am (bottom)**



Why you should always wear your Lab Coat...

Date: Wed, 29 Mar 2000 11:01:22 +1000
From: Phil Denniss <denniss@Physics.usyd.edu.au>
To: all_users@Physics.usyd.edu.au
Subject: Style tips for the School of Physics.

>From The Onion....

German Auto Engineer Issued Lab Coat

DUSSELDORF, GERMANY--Karl Meine, a new engineer at BMW, was issued a white lab coat Monday, giving him the air of a man at the forefront of German automotive technology. "Karl will wear his lab coat and observe BMW prototypes being driven at extreme speeds on sheets of gleaming ball bearings," said BMW chief engineer Gunnar Hoechst. "He will also stand before a wall of computers as cars are subjected to advanced 59-point wind-tunnel tests in stark, white rooms." In addition to the lab coat, Meine has been issued a clipboard.

http://www.theonion.com/

AIP (NSW) Talk & Meeting

Venue: Slade Lecture Theatre, School of Physics.
Date and Time: Monday 10th April, 4:00-9:00 pm.

The NSW Australian Institute of Physics is holding three separate but related talks on the uses of energetic proton beams in medical research and treatment and also for research into applied physics and other areas. All three speakers are on a National Steering Committee for the development of an Australian proton facility able to produce such beams. They particularly want to raise interest in and feedback from the Physics community for these research goals, as well as to describe their own research.

1. "Australian Proton Facility: Status Report."
Speaker :Sue Bleasel, Manager, Business Development - Medical, Hitachi Australia Ltd.
2. "Proton therapeutic beams: semiconductor advanced dosimetry and other applications"
Speaker: Dr Anatoly Rozenfeld, Department of Engineering Physics, University of Wollogong
3: "Proton radiotherapy: Is there a role in Australia?"
Speaker: Dr Tomas Kron, Newcastle Mater Hospital.

Schedule
4:00 -> 5:45 pm AIP Executive Committee meeting, Foundation Room.
5:45 -> 6:00 pm Tea, coffee and biscuits, in the Slade LT.
6:00 -> 7:10 pm Talks by Sue Bleasel, Anatoly Rozenfeld and Tomas Kron, Slade LT .
7:10 -> 7:30 pm Discussion and Feedback, Slade LT.
7:30 -> 9:00 pm Dinner at the Buon Gusto Restaurant, 368 Abercrombie St., Chippendale.

Please contact Iver Cairns on 9351 3961 for more information and to reserve a place at the restaurant.

Physics in Industry Day 2000

Venue: Macquarie University Union. **Date & Time: Wednesday 3rd May, 9am - 4.30pm.**

The NSW Australian Institute of Physics will hold a "Physics in Industry" day at Macquarie University. The aim of the day is to promote dialogue between industry, universities and government research institutions. Attendance of students, especially research students, is strongly encouraged. The day should be valuable in providing opportunities for students to make contact with prospective employers.

The program will consist of a series of short presentations by representatives from Government bodies, CRCs, industry and universities who are directly concerned with the commercialisation of technology. More information may be found at:
www.physics.usyd.edu.au:80/naip/industry/industry.html.

A key part of the day will be a poster session at which a selected group of up to 15 postgraduate students and their supervisors will present details of projects with significant technological content and commercial application. These poster presentations will compete for three prizes, judged by a panel of industry representatives. First prize will be $1000. Anyone who wishes to enter the poster competition should see the website given above.

Attendance costs $15 for students – a registration form may be found at:
www.physics.usyd.edu.au:80/naip/industry/industryform.html