Newsletter

THE LOWBROW CORNER

Today, in case you haven't noticed, we are
having officer elections.   Let's here it for
the officers. May 9, is national astronomy day.
Let's here it for astronomy. We need volunteers
to help. Let's here it for volunteers. Contact
Mike Potter or Don Luttermoser. Let's here it for
Don and Mike. Yea!!!

THE UNIFIED THEORY OF ELEMENTARY PARTICLES AND FORCES

AND ITS IMPLICATIONS TO ASTRONOMY

by: Don Luttermoser

Matter is built out of just two classes of
elementary particles: the leptons, such as the ele-
ctrons and the quarks which make up the protons,
neutrons and many related paricles. Four basic
forces act between the elementary particles: gravi-
tation, electromagnitism, weak and strong nuclear
forces. An ambitious new theory now promises at
least a partial unification. This theory does not
embrace gravitation, which is by far the feeblest

of the forces and may be fundamentally different
from the others. If gravitation is excluded,
however, the theory unifies all elementary particles
and forces. This theory provides a rationale for
several established features of the physical world
that have long seemed mysteriously arbitrary. It
accounts for the quantization of electric charge.
It gives a value for relative strengths of the three
forces that is in reasonably good agreement with
experimental results.. It might explain why there
is more matter than anti-matter in the universe.
It also predicts the decay of the proton, a particle
that has always been considered absolutely stable.
The University of Michigan's Physics Department is
now preparing an experiment to detect this proton
decay. All these predictions have a great signi-
ficants on the understanding of the universe. None
more important than the suggestion that neutrinos have
mass and oscillate from one type of neutrino to another.
Since the ratio of neutrinos to protons in the universe
is about 1 billion to 1, the additional mass of the
neutrinos would be more than enough to close the
universe.

April 10

Sat. 11 ◑ First quarter moon, 6:11 a.m.
12 Twenty years ago today, Yuri Gagarin became the first human
to travel into outer space, orbiting our planet for 108 min-
utes! The Columbia is launched--maybe?--please??
13 Pluto at opposition, magnitude 13.7. A photograph of the right
part of the sky plus a good map might find it for you. Position:
13h49'32" and +7°40.9' on Bootes-Virgo border. Since January
of 1979 Pluto has been closer to the Sun than Neptune.

14
15 April Fireball meteors, a shower that is annual, sparse and ir-
regular--but what meteors there are turn out to be exceptional-
ly bright (hence the name "Fireballs"). The radiant is somewhere
between the ecliptic, the celestial equator, 20 hours and 24
hours of right ascension.
Birthday of a certain astronomy & space popularizer, not Carl
Sagan.

16
17 Astrofest with Jim Loudon: The Legacy of Skylab; The Mission
of Apollo-Soyuz; shuttle update with more late films. "Space
Rap", your chance to ask Jim Loudon anything about space/astro-
nomy.

Sat. 18
19 Easter Sunday. Why is this listed in What's Up? Ask me, and
at least I'll know that somebody reads the newsletter!
○ Full moon, 2:59 a.m.

20
21
22 April Lyrid meteors, sometimes 10-15 per hour, but this shower
seems to be on the decline in recent years. The peak is at
3:00 a.m. but the moon is in the sky well before that and until
dawn.

23
24
Sat. 25 Daylight-Savings Time returns at 2:00 a.m. tomorrow--so set your
clocks foward an hour tonight!

26
27 ◐ Last quarter moon, 6:14 a.m.
Mercury moves into morning sky.

28
29
30

May 1
2 Since the moon is new tomorrow,* this is a reasonable time to
head for the clear (hopefully) dark skies of Peach Mountain.
It's also a good time to try to find Uranus with your unaided
eyes--see May 19.
3. Eta Aquarid meteors, 10-40 per hour, peak is 8:00 p.m. or 5:00
a.m. Eastern Daylight-Savings Time. See small article about
why you should go watch this shower (elsewhere in this issue).
4 ● New Moon, 12:19 a.m.
5
6
7

*Oops. Well, the day after tomorrow, at any rate.

May   8
Sat.   9 Astronomy Day 1981. Watch for exhibits courtesy of the Univer-
           sity Lowbrow Astronomers around Ann Arbor, notably on the Diag.
       10 ◐ First quarter moon, 6:22 p.m. Also, Neptune's rings discovered?
       11 Anthropologists discover concrete evidence that "scientific cre-
       12 ationists" and certain breeds of astrologers are, indeed, de-
       13 scended from apes.
       14
       15
       16
       17
       18 ◯ Full moon, 8:04 p.m. E.D.T.
       19 Uranus at opposition. Shining at a mere 5.8 magnitude, it should
           be visible with unaided eyes on a good night from a place like
           Peach Mountain--after May 26 or so, because right now the moon
           is in the way.
       20
       21
       22 May meeting of the University Lowbrow Astronomers, 8:30 (!) p.m.
           5006 Angell Hall.
Sat.   23

The Eta Aquarid Meteors

by Jim Cypser

        This year the moon won't set until 2:00 a.m. the night of
the Perseids, August 12. The peak for that shower is at either
9:00 a.m. the next day or 1:00 a.m., an hour before moonset. This
means that only the rise to or the decline from the peak will be
visible, depended upon which peak is the real one.
        What about the Geminids in December? On the night of that
peak the moon is up from 7:00 p.m. until 10:00 a.m.
        The Eta Aquarids, at rates of 10-40 per hour, may end up
being the best shower this year. It is regularly reported as being
the best for the Southern Hemisphere, just as the Geminids and
Perseids roughly tie for first from these latitudes. The radiant
is shown below, at 22h30m and -2°. The Eta Aquarids are described
as being fast, with the brighter ones often yellow. They also
have a rep for leaving long glowing trails. The Eta Aquarids and
the Orionids of October are both composed of fragments of Halley's
Comet. A substream of the Eta Aquarids which peaks about May 8
is called the Halleyids (radiant 22h32m, -1°). If you'd like to
go to Peach Mountain to watch these or simply to go to Peach Moun-
tain, see the sign-up sheet. The peak is either the early morning
of the 3rd or the early evening of the 4th, Sunday and Monday respec-
tively. However, there may well be quite a lot the Saturday or Friday
before then, because this stream isn't quite as narrow, as say, the
Perseids.

What About Easter?

by Jim Gypser

Easter falls on the Sunday <u>at</u> <u>or</u> <u>after</u> the first full moon after the vernal equinox. This year the full moon on March 20th missed being after the vernal equinox by about two hours. If the full phase <u>had</u> occurred that couple of hours later, Easter would have been on March 22nd. The way things worked out, the next full moon was the one in April, on Sunday the 19th. Since that Sunday is, as the rule says, "at" the full moon, we have one extreme (the late full moon) modified by the other (the day of the week). If the 19th had been a Monday, Easter wouldn't have been until the 25th, the latest it possibly can be. Question; when will this next happen?

map showing Eta Aquarid radiant
(oops)

*What about <u>toads</u>?!

Impure Mathematics

Once upon a time pretty little Polly Nomial was strolling across a field of vectors when she came to the boundary of a particularly large matrix.

Now Polly was quite convergent, and her mother had made it an absolute condition that she must never enter an array without her brackets on. Now Polly was feeling badly behaved, and she ignored her mother's command on the basis that it was insufficient and made her way in amongst the complex elements. Rows and columns closed in on her from all sides; tangents approached her surface. She became tensor and tensor. Quite suddenly, two tangents and a branch of a hyperbole touched her at a single point. She oscillated violently, and lost all sense of a directrix, and went completely divergent. She tripped over a square root and plunged headlong over a steep gradient. When she rounded of once more, she found herself in an apparently non-Euclidean space; alone and inverted.

She was being watched, however, by that smooth operator, Curly Pi. As his eyes devoured her curvilinear coordinates, a single expression came over his face. He wondered, "Was she still convergent?" He decided to integrate improperly at once. Hearing a common fraction behind her, Polly rotated to see Curly Pi approaching with his power series extrapolated. She could see by his degenerate conic and his dissapative terms that he was bent on no good.

"Arcsin" she gasped.

"Ho, ho." he said. "What a symmetric little asymptote you have. I can see that your angles have a lot of secs."

"Oh, sir" she protested, "keep away from me. I haven't got my brackets on."

"Calm yourself, my dear," said our sauve operator. "Your fears

are purely imaginary. What order are you?"

"Seventeen" replied Polly.

Curly leered, "Now I suppose that you've never been operated on?"

"Of course not. I'm absolutely convergent." replied Polly quite properly.

"Come, come." said Curly Pi. "Let's take off to a little decimal place that I know of and I'll take you to the limit."

"Never!" gasped Polly.

"Abscissa!" he sore, using the vilest oath that he knew. His patience was gone. Crushing her over the coefficient with a log until she was powerless, he removed her discontinuities. He stared at her significant places and began smoothing her inflection points. She felt his hand tending toward her asymptotic limit. Her convergence would soon be gone forever.

There was no mercy because Curly was a heaviside operator. Curly's radius squared itself; her loci quivered. He integrated her by parts; he integrated by partial fractions; the complex beast even went all the way around and did a contour integration. Curly went on operating until he had satisfied his initial condition.

When Polly got home that night, her mother noticed that she was no longer continuous but had been truncated in several places. But now it was too late to differentiate. As the months went by, Polly's denominator increased monotonically. Finally, she was admitted to the hospital, where she generated a small but pathological function.

The moral: If you want to keep your expressions convergent, never allow them a degree of freedom.