

PHYSICS AT SOUTHERN

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Published once in awhile
For students, past & present, and friends of the Department

(SAU logo here)

(Physics Dept logo here)

EDITOR RETURNS FROM VACATION; TWO ISSUES IN ONE WEEK!

He realized that he failed to include news received from many of you during the summer.

FACULTY ATTENDS MEETINGS

Dr. Kuhlman attended the summer meeting of the American Association of Physics Teachers at the University of Guelph.

Dr. Hefferlin attended the 4th International Conference on the Philosophy of Chemistry, in Poznan, Poland. Then he took some vacation time while in Europe.

ARTICLE

"The Textures of Chemical Spaces," J. Mol. Struct. (Theochem) vol. 506, pp. 71-86 (2000), by Dr. Hefferlin. It presents periodic systems from a new perspective and (Sections 5.5 and 5.6) indicates the direction that his research is taking now.

If you would like a reprint, answer by return e-mail!

Errata:

1. Two lines above Eq. (8), "acyclic" should be "linear/bent."
2. Three and two lines above Eq. (11) it should say "There are kite-shaped molecules such as COOO and their isovalent counterparts."
3. The last two terms in Eq. (11) should be "C4 plus or minus 2".

WEB SITE

Corrections and additions to the site are being made regularly. The Tour of HSC still has its faults, but it does give you a great introduction to our new Science Center. Comments on the site are welcome and sooner or later are acted on!

THIS SUMMERS' NEWS FROM THE COGNICENTI

~ Richard Boskind wrote:

"There are so many things to do and so little time. Seems that there is something I could contribute to everything but this means that I have nothing to contribute. Now there is an oxymoron. Anyway, my wife seems to get more done than I do.

On the 4th of August, Marte and I are to do Alaska with Chris and his wife Connie. We are supposed to get back on the 18th of September. Upon return we are marrying off our 4th and last the next week.

~ Roy Cambell is doing QCD lattice-gauge computations using batches of computers in parallel (but communicating), and is finding other fields where the same method can be used.

~ Rick Cavanaugh, one of our most faithful correspondents, wrote from the University of Heidelberg and CERN:

Experimental high energy physics, on the other hand, has outgrown itself from a university based entity to a national and even international entity. The experimental collaborations are so large (typically 500 to 1000 authors on a single paper) and so expensive (10's of billions of dollars) that no single country can cope with the costs. The good news is that with that kind of budget, there is a great deal of work which needs to be done in the immediate and foreseeable future. This makes post-doc positions relatively easy to find at the moment. The bad news is that, at least in Europe, for every 10 post-docs, I guess there is something like only one opening for a permanent position--and the competition is very stiff. Conclusion: the budgets are being used to build experiments(!), not fund faculty positions. I am less familiar with the exp. high energy physics situation in the US, but I have heard that it is only slightly better.

~ Earl Cornell wrote, just after the (virtual) completion of the human-genome mapping was announced:

"It was interesting to have a project that I helped with to be associated with such hoopla. I only got in on the tail end of the project since about two years ago they cut back on R&D so they could setup the PSF (Production Sequencing Facility). I think that they sequenced 3 chromosomes there. The group that I am working with (Bio-Instrumentation / Eng. Sci) is now working on parts of the next step in the process.

"They now know of 150,000 genes but know only a little about the proteins that these genes express which is of course the useful information from a medical point of view. While the protein chain is determined by the DNA sequence it can fold in many ways and bind back on top of itself. We are working with the MCF (<http://www.lbl.gov/LBL-Programs/mcf/>) to automate mounting and centering of protein crystals in the x-ray beam at the ALS which is used to determine their structure using diffraction. And last year developed a robot to automate combinatorial protein crystal growth (<http://www.lbl.gov/Science-Articles/Research-Review/Magazine/2000/Winter/features/03robot.html>)."

~ Steve Gotherd still works for Hewlett-Packard in Boise, Idaho, designing Laser Jet printers.

~ Blake Laing wrote from graduate school at the University of Oklahoma:

Things are going well here. I've been granted my wish for research that is WAY out in theory-land. I don't remember if I told you or not, but my group has been using an approximation method in which use the following procedure:

We generalize the Hamiltonian of the radial Schroedinger equation (Laplacian AND angular-momentum operator) to D dimensions, [and then try to] cleverly scale the coordinates by a power of delta which is inversely proportional to D.

In the large D limit we are left with the classical picture of a particle at rest in an effective potential. We solve for the minimum of this potential and then take the Taylor expansion (in powers of delta of course!) of all terms about this minimum.

We are left with an apparently huge ... series in delta, but we are usually able to cleverly combine them, and collecting the powers of delta leads to the infinite set of inhomogenous equations, the terms of which may be solved for iteratively if we played our cards right.

So we end up with series in D for the wave functions and energies that approximate known values with varying degrees of success.

~ Bill McKay wrote:

"Well, it is time for another monthly report. The status of the fractured leg is considerably improved. I have just started walking on a quad cane in the house and can now go several hundred feet at a time with the walker outdoors. All this is with reasonable comfort. I no longer need medication for pain, as long as I am careful in how I do things, and some chores are now possible. I'm going to try mowing the lawn with a riding mower shortly. And, speaking of riding, I now have been cleared to drive!!! It is hard to describe how liberating a good set of wheels is. So now it is just a matter of patience and caution as I increase activity levels with time.

"Again, I am grateful for the thoughts and prayers of all who share that activity and I thank you.

"Life here goes on. Ann continues working at the retirement center in Fort Worth, and the duties of the home are sort of split . Depending on what I can do. It is a real challenge to pet four dogs at the same time. It usually ends up that none of them are real happy."

RECENT LETTERS SMs

~ Jonanthan Knoll, a Physics major serving as an SM this year, sends two issues of a well-edited journal and five photos. Unfortunately, they cannot be included or attached with this issue.

~ Nick Vence, from whose letter excerpts were included in the last issue, also sends a Web photo showing the more arduous aspects of life as an SM:

<http://www.jps.net/mach5/diving/>

* His first communication consists of this terse note referring to attached file "Pohnpeian Progress 1"; several photographs were also attached. His second communication consists of "Pohnpeian Progress 2," also attached, all by permission.

** Referring to TheHuts, attached

THE LAST LAUGH (IF YOU HAVEN'T SEEN IT BEFORE)

>The Honor System Virus

>

>Greetings!

>

>This virus works on the honor system: You must now forward this message to
>everyone in your address book and then personally delete a bunch of your files.

>

>Thank you so much for your help.

>

>The Virus

(Ray Hefferlin is responsible for everything in this issue)