ACU Physics Research Weekly Newsletter

Volume 17, Issue 4
July 4, 2011

DANGO (DOINGS AND GOINGS ON)

Updates from the Students

From Erik Ringle:

After evacuating from Los Alamos due to the fire, Ryan and I went to Santa Fe to stay. While we are not working, I have been enjoying the break. Santa Fe is a really interesting town. Lots of art to look at. Apparently it has the second biggest art market in the country. Equally interesting, the Native American vendors have exquisite goods.

We hope to be returning to Los Alamos this weekend. We will have to see.

My family is here to explore the area with me. We were able to go rafting on the Rio Grande on Friday which was a blast.

Erik Ringle

From Ryan Castillo:

Hello,

This week has about as uneventful as any week can possibly be. Erik and I had to evacuate on Monday, I think. It may have been Tuesday, everything is started to run together. Anyways, the lab is closed through Monday as far as I know so we're in for a skimpy paycheck and a long weekend. I've been occupying my time with board games, books, Dr. Who, and Eureka.

Ryan

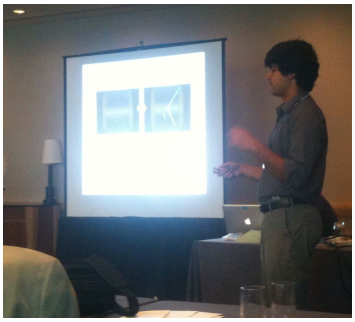
From Sarvagya Sharma:

Dear DANGO,

This week I was in Florida with Tyler. We both gave talks in the NIFFTE session for the annual American Nuclear Society meet. This was our first ANS conference and it was interesting to note the differences between ANS and other physics conferences (fewer technical sessions for one).

Other than working from our hotel room, we visited the beach and explored a fair bit of Hollywood, Fl.

Sarvagya



Sarvagya's talk at ANS

From Tyler Thornton:

Dear Dango,

I did not get much research done this past week. Sarvagya and I went to Hollywood, Florida for the American Nuclear Society (ANS) Summer conference. Since NIFFTE receives a lot of funding from nuclear engineering people, we had to go to give an update of the experiment. Sarvagya discussed his Hough/Kalman code, while I talked about the simulations of the TPC. Tony Hill was surprised by the number of people in attendance.

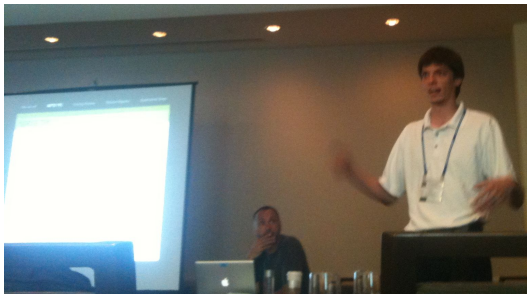
Sarvagya and I spent most of the week in the hotel room (I was trying to work), but we kept getting kicked out of the room by the cleaning people. When this occurred we spent time at the pool and on the beach.

I was able to look more at the analysis of the spread of the tracks. I am still getting a 1/x correlation with the cosine of the polar angle, which

still does not make since to Mike Heffner nor I. I have also been thinking about what needs to be done with the simulations to make them consistent. I have made a page on the NIFFTE wiki, and hopefully I can
get some of the other people looking at the code to help me on some of the tasks.

That was my week, next week should be more eventful with a meeting everyday.

Remington Tyler Thornton



Tyler's talk at ANS

From Holly Thornton:

Hello all!

So it has been a quiet but productive week here in Idaho. Quiet because Tyler, Sarvagya, and just about all of the professors were gone at various conferences, and productive because I got a lot of work done. AS I've said before, we've been working on getting set up in a new building. This week we finally finished correcting the blueprints, got a lot of equipment moved in, and I wrote out some procedures for some of the equipment.

I'm glad that everyone is back and I'm looking forward to this long relaxing weekend. We don't really have any big plans, but I think I'll get through a few more books.

Have a good Fourth everyone!

-Holly

From Dasith de Silva:

Hey all!

This week has been a pretty mellow one. Not much to do since I did the watch shift. Mainly read a few technical things. Watch shift turned out to be pretty boring but since I was a day shifter, it wasn't as strenuous as earlier. The weekend is upon us, the fact that it is a long weekend makes it even better. I get to do some traveling this weekend so I am psyched about that. I hope y'all have a great 4th of July. To the guys at LANL, take care! Hope everything gets back to normal for y'all in the coming week!

Have an awesome weekend!

Dasith.

From Kyle Gainey:

Hello everyone,

This week was rather hectic but overall very nice. The noise tests for the RPC1 prototype were put on hold as the DAQ computer decided to take the week off and unplug its phone. We finished up all of our transition card work, which was bittersweet. I helped finish up the gas leak tests on the gas gaps and coated transition cards with a resistive glue-like substance to increase the likelihood of their proper function for years to come.

This (long) weekend we plan to go tubing with some folks from church in the crystal-clear waters of the long island sound. I've read a lot of books, and am probably going to finish a couple over this weekend. We'll see. I hope everyone else is having a wonderful time.

Adieu,

Kyle

From Ramsey Towell:

Hello Dango,

I pretty much hated work this week. I cut mylar almost the whole week and my back is just about broken from bending over the low table for 8 hours. We finally finished soldering the cards this week so now I am limited to just cutting and taping copper and mylar. On the bright side though, we went to go see X-Men and it was pretty sweet! That's all I got this week.

Ramsey

From Walker Nikolaus:

So still no luck with Settlers of Catan, however I owned at Pokemon Monopoly.

In other news, we finished making our transition cards this week, which is awesome. Making transition cards is pretty much all that we have been doing for the past three weeks, so now that they are done we have begun to move on to other steps in creating the detector. I have done a lot of copper cutting with a box cutter (I am pretty sure the box

cutter manufacturers did not have copper cutting in mind when they produced their product). Work has become more interesting with this new integration of copious tasks. I hope that everyone has an excellent 4th of July.

Doo,

Walker Nikolaus

SeaQuest E906

From Andrew Miller:

Dear Dango,

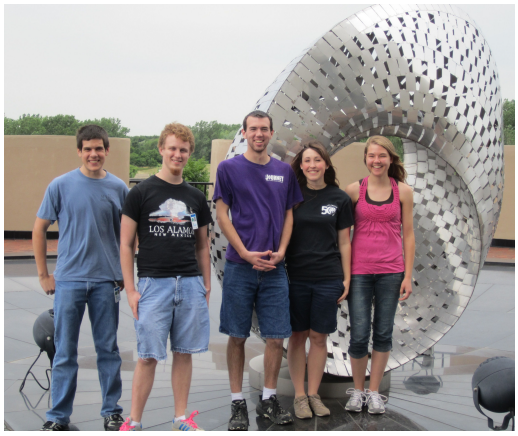
This week has been very productive! At the beginning of the week we were having problems with our equipment, we were looking for a qvt to use with an oscilloscope in place of the emoprho (which we found out was broken last week). We found a qvt that was labeled as bad last Friday, so we took it to PREP for repair.

On Tuesday they gave it back telling us it worked fine. After searching for a working oscilloscope (we got lucky with the third one we tried) we then tried to get a good picture of the hodoscope spectrum using a Cesium source. Unfortunately, things weren't working too well, and we were still having trouble trying to get a picture out of it. Then we went looking for a second qvt. We found a qvt that we had overlooked before, and hooked it up, and suddenly all our pictures were beautiful!

So we took the broken qvt back to PREP, this time being specific about how it was broken, and then began taking measurements with the working qvt. In order to save the data from each PMT, we got out an oscilloscope that runs on Windows 98 (it's pretty neat). The only thing that would make it better would be a USB port, so that we could easily get the image files we save off of the machine. Instead, we have to connect to it with the ethernet port. I discovered that it takes some work to share files between Windows 98 and Windows 7. After playing with lots of settings though, I was able to access the hard drive of the oscilloscope with my computer, so we were able to start taking data. We've now finished gain matching 3/7 of the PMTs, and things are going very well. We've also been making lots of cables (ribbon and hv). Oh, and today we finally took our picture.

Until next time,

Andrew Miller



Andrew, Tyler, Brandon, Mandi, and Kristen at Fermi Lab

From Brandon Bowen:

Dear Dango,

This week has been quite a success in the realm of gain matching our hodoscopes. We have now match the Compton edges and charge spectrums for 3/7 of our PMTs. Also, this week, we have constructed 240V line split box in order to monitor the power while the 240V power line is still plugged into the LeCroy 1440 high voltage supplies. In addition, we posted flyers all around the city for the Let's Start Talking campaign that is coming later this month.

Have a good next week,

Brandon Bowen

From Mandi Crowder:

Dear DANGO,

This week a lot of things fell together. After many epic instrument fails, we finally obtained a working qVt to start gain matching the hodoscope PMTs. So far, we are 3/7 of the way there. Kristin and I cut mylar in order to insulate the target. Brandon and I finally received all the parts we needed to build the box that will allow us to safely monitor the power going into the Station 1 and 2 hodoscopes. In-between we made ECL cable bundles for Station 1 and 3 wire chambers. Thankfully, the cables we made this week did not need to be lined with foam because the noise was reduced enough by ferrite clips.

On the Fermi roads, our group helped turtles cross the road twice. Below are pictures of one of the incidences. J This weekend all of us, except Kristin, are going to Tyler's house for the fourth of July weekend, and Brandon and I got an ice cream maker, so that will be exciting to try out! I hope everyone has a wonderful and safe holiday weekend!

Mandi

Tyler Hague helping a turtle cross the road

From Kristin Holtz:

Hi Everyone!

This week we've gotten lots of work done. We began our week by cutting several sets of 26 ribbon cables for the wire chambers. After cutting them all to the correct lengths, we put connectors on the ends, tested them, and bundled them together. We also cut out pieces of Mylar to insulate a target and we still have to cut out about 10 more pieces for that. Other than that, the majority of our time has been spent gain matching the PMTs for our station 3 and 4 hodoscopes. We're making good progress with that now, but we still have more than half of them to match using a QVT and oscilloscope.

On Wednesday we went to Argonne in the morning to listen to Murray Peshkin talk about science and religion. (I apologize for writing in the incorrect name last week.)We also sat in on a discussion about grad schools, which was pretty interesting. Our dinners without Mrs. I have continued to go well and taste delicious.

Until next time,

Kristin Holz

From Tyler Hague:

Hey Dango!

This week has been interesting as far as what I've been working on. I continued with working on the tracker doing a little more optimization and a couple more small odd jobs in it. Currently I am awaiting more orders on that front. Josh (the post-doc I am working on this with) has to get part of the forward tracker fixed before he can give me more tasks. Yesterday I got to work with Kaz a bit on the DAQ. Kaz had just installed a new TDC card on ROC8 which was causing problems. The problematic part was anytime it went into prestart, it crashed the event builder. So, I was enlisted to help diagnose the problem. Kaz ended up finding the problem though; turns out the compile flags were incorrec,t so it was trying to run in 24-bit mode instead of 32-bit (or vice versa, I forget which).

On Wednesday, the rest of the ACU people up here went with me to Argonne to hear Murray Peshkin speak on why science and religion cannot logically conflict. What did we learn you may ask: We learned that most student interns at Argonne are very against religion. Afterward, we went across the hall for a graduate school Q&A session. Various post-docs and a couple faculty answered any questions we had about grad school.

This weekend everyone up here except Kristin are heading to my place in Indiana to hang out, make homemade pizza and watch fireworks. It should be a lot of fun.

Until next week,

Tyler

Other Projects

From Scott Stewart (working in N-1: Safeguards Science & Technology at LANL, New Mexico):

Hi Dango,

Not too much going on this week. The lab is closed because of the 80,000 acre Los Conchas fire, and the town site remains under mandatory evacuation. I first went to Creede, CO with some friends and now I am in Golden, CO with the Pickles and Pamplins for the 4th.

Hope everyone had a great week.

Scott Stewart

Updates from Professors

From Dr. Rusty Towell:

Hello Dango,

I'm writing from Trinity Western University near Vancouver, BC, Canada as I attend the ninth Christian Engineering Education Conference. Since ACU has agreed to hire an Engineer to help start an engineering program, I decided this would be a good conference to attend. I've had lots of great conversations with Christian engineers that are very willing to share advise about starting an engineering program. If anyone knows an engineering professor that might be interested in coming to ACU, please let me know!

Earlier in the week I enjoyed being back at ACU for 2 days. I got to see Lois Marie, Dr. Head, Shon, and 16 incoming freshman. It looks like we will have a great group of freshman this fall. I encourage all of you to help welcome them to the department this fall. As usual we (SPS) will plan a fun social event for the first week of the semester. Please plan on being there to welcome these new students, have fun, and brag about how cool your summer was.

I've also submitted an abstract for the Division of Nuclear Physics (DNP) meeting this fall. I look forward to attending this meeting with many of you as you attend the CEU program there. I was excited to see an Abstract from Daniel Jumper also. Daniel graduated from ACU 2 years ago and is now a student at UIUC. He is still working on the RPC test stand there that he helped set-up when he was an ACU student. I look forward to hearing about his work at the conference.

My thoughts and prayers go out to everyone in Los Alamos. Just for the record there was no fire near the lab when I left Los Alamos.

Grace and Peace,

Rusty

From Dr. Michael Daugherity:

Dearest DANGO,

Last week we had a chance to go see House of Blue Leaves on Broadway starring Ben Stiller. We had amazing seats on the same row as actor who played Tony Soprano. However, the picture says it all: even the theater wants you to go see a different a show. The first act went pretty well for me. Apparently Ben Stiller learned how to play piano for this role, and he did a good job. The real star of the show was Edie Falco, who used to play Tony Soprano's wife and is now Nurse Jackie The second act started with Allison Pill, from Scott Pilgrim vs. the World, who should have had a much bigger part. Right after that, three nuns burst in through the window, and the play took a nose dive. It improved a bit after two of the nuns blew up (yes, it was a dark comedy), but the ending was extremely off-putting. Regardless, it was still a fun experience and an amazing evening Manhattan.

Dr. Daugherity

A picture from Manhattan

From Dr. Josh Willis:

Greetings Dango,

This is my first Dango this summer, but also my first Friday back in the US, after 22 hours of travel yesterday (and the day before, depending on which time zone you start the count in).

I think I'll say a little bit about my work for the past six months, and parcel that out over upcoming weeks as I also report on what I've been doing that week (thought the next two Fridays I'll be traveling).

As some of you know, I spent six weeks at the Max Planck Institute for Gravitational Physics (also officially the Albert Einstein Institute) in Hannover, Germany, to involve myself in gravitational wave research, as I move to that from quantum gravity. So basically the last six months were a crash course in gravitational wave data analysis and related tools. It was very interesting work, and I look forward to going back there next summer.

Last week I mostly spent doing lots of procedural things connected to getting ready to leave. The one main work related project was some timing tests on optimizations I was doing on the analysis code used

by the CBC (Compact Binary Coalescence) group that I'm a part of. Most of the computational time in that is devoted to taking a Fourier transform of the data for matched filtering (I'll explain more about matched filtering in a later Dango). This is a critical step in much of signal processing, so there are lots of libraries out there that do it. Ligo uses one called FFTW, the Fastest Fourier Transform in the West. And it turns out they've been using it suboptimally, and that if you use several features of the library you can speed things up by a factor of about two. So I was testing recompiled versions of the library to verify that they don't break anything.

I will also try to parcel out pictures, so for this week I'll start with one of me at the Institute.

Josh Willis

Dr. Willis at the Albert Einstein Institute

Hai Qu's talk at ANS

Happy Fourth of July!!!

In Other News

CEU PROGRAM, East Lansing 2011

APPLICATION DEADLINE: 1 August 2011

What: Conference Experience for Undergraduates (CEU) - Fourteenth Annual
Where: 2011 DNP Meeting, East Lansing, MI
When: 26-29 October, 2011
Sponsored by: NSF, DOE, DNP

All undergraduate students who have participated in nuclear physics research are invited to apply! Students will present research posters and participate in several CEU and conference related events. Travel and lodging awards will be granted to a number of the top qualifying students. Please refer to the CEU website for more detailed information, updates, and application information:

http://physics.westmont.edu/ceu/

PROGRAM
CEU11 will include the following highlights: student research poster session, undergraduate nuclear physics seminars, graduate school information session, CEU social reception, and regular DNP conference events, including attendance at invited and contributed talks.

QUALIFICATION AND APPLICATION
Students (fall 2011 returning undergraduates) who have participated in experimental or theoretical nuclear physics research are invited to apply. The online application (found on the link above) consists of a research abstract and a brief summary of the student's individual contribution to the larger group effort. Application deadline is 1 August 2011. Applications will be reviewed and travel and lodging award decisions will be based on the quality of the research, and the imagination and creativity reflected in the student's contribution.

QUESTIONS
Contact Warren Rogers <ceu@westmont.edu>

ALL UNDERGRADUATE STUDENTS WHO HAVE PARTICIPATED IN NUCLEAR PHYSICS RESEARCH ARE ENCOURAGED TO APPLY!