

DANGO (Doings and Goings On)

Winner of last week's Photo of the Week Contest

"Traditional ACU group picture in front of the BNL sign." –Dr. Rusty Towell



Updates from the Students



FROM RYAN PINSON:

Hey DANGO,

So this week was pretty crazy. The Towell family arrived late Sunday night to a spotless apartment. Ramsey, Andrew, Marshall, and I moved into a smaller apartment over the weekend. Monday was the start of the PAC meetings at BNL so we attended several of the morning meetings and then after lunch we worked on our scripts to better organize them and touch up some parts as well as

add a few new things. Tuesday and Wednesday we also had a few meetings, more of the PAC meetings as well as the Forward Upgrade Quarterly meeting. Wednesday that the water at the apartments was out for most of the day due to a water main breaking, which allowed us to work in the convenience of our apartment.

Thursday we attended more meetings as well as cleaned up the factory tent organizing LEMO cables. Thursday evening Matthias gave a talk over the G-2 experiment and then took us to see the magnet as they prepared to load it onto a truck to take it to a barge for transportation to Fermilab. This weekend we have big plans for Ramsey's birthday, which will include seeing the new Superman. That's all for this week.

–Ryan Pinson

FROM MARSHALL TOWELL:

What it does Dango. So on Monday we went over with my Dad everything that we did while he was gone. I also began to document everything that our code that we wrote does and how it works. After I typed it all out in a work document Ryan helped me revise it and then helped me put it in L^AT_EX. On Tuesday and Wednesday we mostly sat through a lot of meetings. Thursday and Friday we worked a lot in the factory and spent a lot of time separating and organizing some cords. Over all this we got a lot of stuff done this week and did work.

–Marshall Towell

FROM ANDREW MILLER:

Hello DANGO #4,

This week has been a lot of fun! On Sunday night, Dr. Towell returned with his whole family, and we have had much larger games of League ever since. We've had a little more direction for our work now that Dr. Towell is with us, so we've been able to move ahead with lots of cleaning and organizing of the factory. I also wrote some more scripts to sort through some values in the database and even made a graph. There is still a lot to do on these scripts though, as we need to do some more checks on each run, and then take the good ones and use them to plot trigger rates and ultimately calculate efficiency.

Yesterday we heard a talk about G-2 and got to go see the giant magnet that they are moving to Fermilab to repeat the experiment. We got a good picture of the four of us in front of the magnet while they were putting the frame on it and preparing it to be put on the trailer. The whole operation was quite impressive, but some of us are still skeptical that they will be able to ship it around the US without being flexed more than 3 mm.

In other news, there was much rejoicing this past week because we were able to get League of Legends to work through the proxy at the apartment. We've also been playing board games, bas-

ketball, and there are rumors that people here play ultimate frisbee sometimes, so hopefully we'll at least meet the minimum requirement for physical activity this summer.

Also, Ramsey's birthday is today (we forgot to sing to him on the phone conference), so we'll be going out to eat this evening and also going to see Man of Steel this weekend.

I hope everyone else is having a great summer so far!

–Andrew Miller

FROM RAMSEY TOWELL:

What hey do you DANGO,

We started off this week by getting my dad up to speed on the massive leaps that we made in the field of nuclear physics since he was in Abilene last week. Also we went to a ton a of seminars and meetings about the preliminary results of the RHIC Run 13 and what all of the various subsystem groups will be working on now that the run is over. We also began the task of cleaning out and organizing the tent where we have been working on the RPCs for the last several years.

My family showed up last weekend, so now I don't have to spend so much money on food. Also my birthday is today (Friday), and I finally hit the two decades mark of being alive. So that's pretty cool. We are going to see Man of Steel on Saturday for my birthday and I really hope it's better than the other Superman movies I've seen.

Bye good,
Ramsey



FROM CHRIS CAMPBELL:

Hey DANGO,

Well our first week as a part of the COMPASS team at UIUC was a success! After getting acquainted with the research team and the project, we got to work continuing the construction of the

Prototype B drift chamber. This involved tension tests of the sense wires (20-micron diameter) and field wires (100-micron diameter), as well as many hours in the UIUC Nuclear Physics Lab clean room assembling PTB's various layers. Next week we will continue this work and hopefully start to solder the sense and field wires onto the setup we've been working on. Also, we're hoping to start working with UIUC's cosmic test stand, organizing its wires, etc. Should be fun.

Apart from COMPASS, we had the privilege of attending a couple of REU talks this week. One was about high temperature superconductivity and the other was about nuclear physics and proton substructure, both were interesting.

Outside of work, we've been having a good time hanging out with the Daughteritys, checking out the various shops and restaurants around campus, and getting to see Man of Steel in IMAX last Saturday with the REU gang.

–Chris Campbell

FROM SPENSER LYNN:

Hi DANGO,

We officially completed our first work week! I'm sad to report that we didn't figure out all of physics, but there's still plenty of time left to finish. I spent the week getting oriented in the labs, doing wire tension tests for the COMPASS drift chamber, assembling the drift chamber in the clean room, and working on the reading assignments from Matthias. Next week we will wire the drift chamber and hopefully clean up the cosmic ray test stand. In non-work news, I found the arboretum which is this great park owned by UIUC a few blocks from our apartment. There are plenty of trails there to run at so I intend on getting to know the place pretty well. I did make the mistake of running through the UIUC Pollinarium which houses a large number of man-made bee hives. Of course I didn't realize this until I was in the middle of the colony. We saw Man of Steel, which sadly disappointed me, and located some of the best BBQ that I've ever had. I've enclosed a

picture of James working on the DC in the clean room. Stay safe and have fun everyone!

–Spenser Lynn

FROM KRISTIN HOLZ:

Hello!

I've spent most of my time this week working on making a simulation of an electrostatic speaker in COMSOL Multiphysics software. The speaker works by creating a sound pressure field with a vibrating graphene membrane. The membrane, held at a constant voltage, is sandwiched between two perforated capacitor plates driven by an alternating current. This causes the membrane to move back and forth towards each plate and produce sound waves. I haven't used the software before and neither has anyone else I work with so it's been a slow process; but I have the geometry made and now I just need to get the program to recognize the currents, tension in the membrane, and other details so that it can produce plots of the electric field and pressure among other things.

I also ran an acoustic impedance test on my clarinet for concert A5 on the tempered scale. Looking at the data, it is interesting to see that the first two harmonics for this note are really sharp because of a tone hole that is open 1/3 of the way down the instrument above any of the other holes that are closed. I'm really interested to see how opening this hole (with the register key) and other register holes affect the harmonics for different notes.

Apart from research, I went swing dancing on Thursday which was really fun and saw Man of Steel with Spenser, Chris, James, and several people doing REU physics and computer science internships here.

–Kristin Holz

FROM JAMES MALLON:

How's it going, Dango?

Wow. The fact that this was just my first week is kinda blowing my mind. Just a little. The week started off fairly well. Spencer, Chris, Dr. D and

I got shown around and chose our offices. We had about 5 hours or so of meetings, but once those were over, we could get some real work done. I managed to play around with Autodesk and get some of the drawings we got from Seclay (may have butchered that) translated into 'murican. After that was done on Tuesday, I worked almost exclusively in "The Barn", where we assembled the drift chamber. This went well, besides a few poorly machined bolts. After running a gas leak check, which indicated only two very small leaks, we took the drift chamber apart on Wednesday, glued a Kapton and carbon layer on the G10 frame, and started putting it back together. On Thursday and Friday, we finished applying a new carbon layer to a new layer of Kapton, and repeated the process of taking the drift chamber apart and putting it back together.

Keep it kicking,
James



FROM ERIK FORRISTER:

Sup Dango!

First of all, I'd like to give a shout out to my man, Francisco. It was his birthday on Friday!

Well this week was about the same as the others. Still working on the motor. I got the serial communication working or at least it spits out what I put in. That's about as far as I've gotten on the communication side. I also made the main part of the program and enabled a reset button. The motor will now go a certain direction until it hits a switch; then it will stop and do it all over when the reset is pressed. I was fighting the program to make the motor stopping even more accurate, but it just wouldn't work. Then I actually calculated that even though the motor might take 4 extra steps, it actually would only go 120 microns in those 4 steps. Dr. Head said sometimes "perfection" gets in the way of "good enough". I'm

now working on the algorithm to input numbers (the chip only inputs 1 character at a time and in a sort of continuous stream). So yeah, progress has been pretty good. I'm taking man-sized steps now, towards the end goal.

Until next time,
Erik

FROM FRANCISCO TERAN:

Hello Dango,

This week has been a really long and hard week. This week after dealing with several programming problems, we were able to make a program that can run the lenses. I worked all week on this program. It took me a while to understand how c# works. Using some examples codes we were able to create this program. It was not easy because this sample program is a generic program. We had to find a way to make it work for our USB. We spend many hours studying the way c# works. We had to play around with the code and run the program to see what it was doing. We fail many times but every fail helped us understand c# better. Every time we ran the program we made little changes to it. Based on the answers we were getting from the program and USB we made the changes. After we got the right answer and everything was working right we had to design a loop to make the USB output channel to generate 4095 samples. Designing the loop was not very easy. We worked on it for a day and a half. Unfortunately this process is too slow and we have to make it faster. Next week I will be working on a program that will allow us to run much faster. We are making progress and that is a good thing.

-Francisco Teran



FROM NOAH KITTS:

Hey everyone!

This past week has been an interesting one. It started out with us figuring out what was wrong

Updates from the Professors

FROM DR. JOSH WILLIS:

Liebe Dango,

This week was filled mostly with running other people's code, trying to fix mine, and commenting on new code other people wrote. In preparation for the f2f ("face-to-face") meeting in Syracuse in a week and a half, some of us here are trying to at least get the analysis pipeline to run with a pycbc executable. We've also been discussing the long term plans for FFT based pipelines, especially over the next nine months before the code and analysis review for the advanced detector era begins (which is expected to take about another nine months).

Most of that is secret LIGO/Virgo stuff that I can't talk about. However since I mentioned the pipeline name (ihope) last week, I will at least pass along that one thing discussed was what the name of the new pipeline should be. The Cardiff group had come up with three options: ahope ("a" for advanced), pyhope (since it's in Python) or nohope (suggestion of a competing analysis group). I am optimistic, though, that we have sold everyone on the idea of Episode IV: a_new_hope. You may imagine for yourself what fraction of the telecon was then spent by a dozen or so physicists making Star Wars jokes. Don't tell the Empire.

Bis nächster Woche,
Tschüss,
Josh

FROM SHON WATSON:

Dear DANGO,

This week I have continued to work hard on the packet receiver program for the Nifftc TPC. I have primarily been using Valgrind's callgrind tool to generate profile data for the packet receiver's performance. After each successful profile run, I analyzed the profile results with KCachgrind. These programs helped me to identify several regions of the packet receiver that could be improved.

After many changes over the week, an offline

with some of the hodoscopes at station 3. Tuesday through Thursday was the User's Meeting at Fermilab, so I got to listen to a ton of different talks. In other news, I broke my ankle Thursday while skating, so I couldn't go to work on Friday. Also, the biggest tragedy that comes from this, other than not being able to walk for a while, is definitely delaying when I will be seeing Man Of Steel in the IMAX theater. Hope everyone is having a great week!

Stay classy,
Noah Kitts

FROM ELIZABETH CARLISLE:

Hi everyone,

This has been an exciting week. Last Saturday, my aunt came to visit from Indianapolis. She picked me up from my dorm room in the village, and we took the train to Chicago. We went to Navy Pier, and then we got to take a boat tour, which was very fun because we both love boats. And then this week we went to the users meeting, where we listened to a whole bunch of talks and learned a whole bunch of physics. On Wednesday, Lacey and I went to an Italian festival. We met some interesting people and got to eat some delicious Italian food, which is always great. On Thursday, we joined the tango club. So now we can learn how to tango. The first lesson was really fun. Not as fun as swing dancing, of course, but still entertaining. So that was my week. And tonight I'm making brownies, which makes it even more exciting!

-Elizabeth

FROM LACEY MEDLOCK:

Hi, This week I attended a bunch of talks at the users meeting. I learned about different experiments there. I also went to an Italian festival on Wednesday with Elizabeth and then to a tango dancing class on Thursday with Elizabeth. We had a good time.

Have a good week,
Lacey

part of the packet receiver's performance has improved by almost a factor of two. This translated into a moderate reduction in CPU usage for the online packet receiver program. Unfortunately, the actual effective throughput dropped slightly. I need to figure out how to improve the online throughput.

Shon

FROM DR. MICHAEL DAUGHERITY:

Dear DANGO,

After two glorious days of work at UIUC, we had a lovely "professor's retreat" in Washington DC arguing why the Department of Energy should keep funding us. In the meantime, it was really nice to go up to FermiLab again and see the SeaQuesters. We also took the kids all around and above Chicago. The view from the top of Dr. Willis' tower really is incredible. After all this travel, what I'm really looking forward to is even more travel in Portland next week to get the latest updates from Physics Education Research.

We started working the Nuclear Physics Lab clean room on our prototype drift chamber for COMPASS. We also have a lot of work to do on the cosmic test stand in Loomis Lab so we get a position resolution measurement once the prototype is done. In order to get below 200 microns will we have to install some Silicon tracking detectors and figure out how to include them in the DAQ. It is amazing to me that we already have to start planning DNP abstracts for this Fall.

Since I'm indecisive, I'm submitting two obvious pictures without captions. Everyone is encouraged to make up their own captions for the last picture.

-Dr. D

FROM DR. DONALD ISENHOWER:

To residents of DANGOLand,
This time I'm doing my DANGO while I'm at the lab as opposed to going home and then forgetting about it due to taking my wife out for her birthday celebration that included going to see the new

Star Trek movie (finally) at the Hollywood Palms. The past two weeks has been spent mostly worrying about our DOE review in DC that all we had yesterday (13th). As all of you know by doing homework and facing exams, it is much easier to worry about it that DOING something about finishing it. So the talk got sent in on the 6th (on the due date rather than being early), but the talk, shared by Towell and Daugherty went well. We don't think we cost ourselves our research and as a consequence don't have to worry about still having work for all of you to do next year. OK, I wasn't really worried about that aspect anyway, but came out looking strong I believe and it was the accomplishment of previous years' students who helped. So pat yourselves on the back if this is your second or later year working with us. The only snag was a tornado warning at the airport on the way back which delayed a lot of flights.

We are still working haltingly through the hodoscopes and getting the voltages set properly. This is something that would be trivial if we had beam and if I could look at each signal, but is a nightmare trying to do it correctly without it. There are plenty of other tasks that have to be finished by August, so the students here will be kept busy. I am glad that Dr. Daugherty decided to travel to DC via Chicago because he did a great job of getting some pictures of students "working." Of course Noah had to make sure he had the most painful week.

From Fermilab,

Dr. I.

FROM DR. RUSTY TOWELL:

Hello Dango,

My family and I safely arrived in NY on Sunday. The older I get the less I take safe travels for granite. Or maybe it has more to do with the advanced mileage of our van?

This week was the bi-annual PHENIX collaboration meeting. So Monday morning we heard talks on the status of the collaboration (strong, productive, but many challenges ahead ...), the

just completed Run13 (extremely successful), preparations for Run 14(major silicon repairs required), and long range plans for sPHENIX and ePHENIX. Tuesday was our quarterly forward upgrade meeting. That was useful in bringing all of us up to speed on the current status of the detectors, analysis, and plans for the future. On Wednesday Matthias, Mickey, and I walked through the factory and made a list of work that needs to be done in the factory that is 3 pages long. PHENIX doesn't expect to be able to continue to use this space in the future so we need to move and store all of the RPC stuff into a new location.

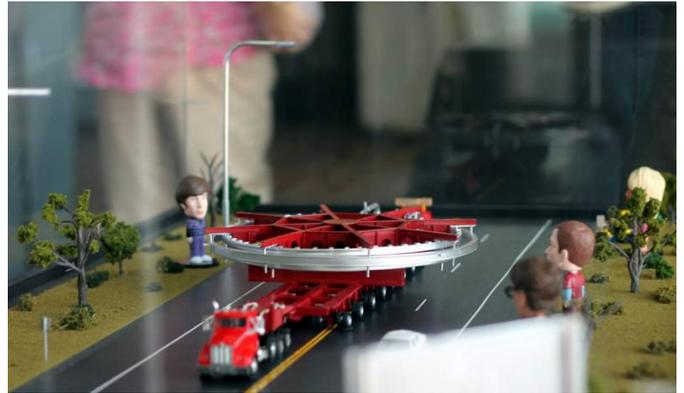
Wednesday evening I traveled to DC for our DOE review. On Thursday Dr. Isenhower, Dr. Daugherty, and I gave our presentation. We all felt that it went well and the review committee was impressed. Despite a tornado touching down near the airport and a four hour delay in my flight, I got back to BNL late Thursday.

Friday I attended the PHENIX Institutional Board meeting where PHENIX considered admitting 2 new institutions into the collaboration. We also met with Francesca to report on our analysis work. She was impressed with the progress we've made. It was good to end our week with a phone conference where we got to hear from everyone. Noah, we hope you are better soon. (and that someone got a picture! :)

Grace and Peace,

Rusty

Photo of the Week Candidates



#1: -Dr. Michael Daugherty



#2: -Dr. Michael Daugherty



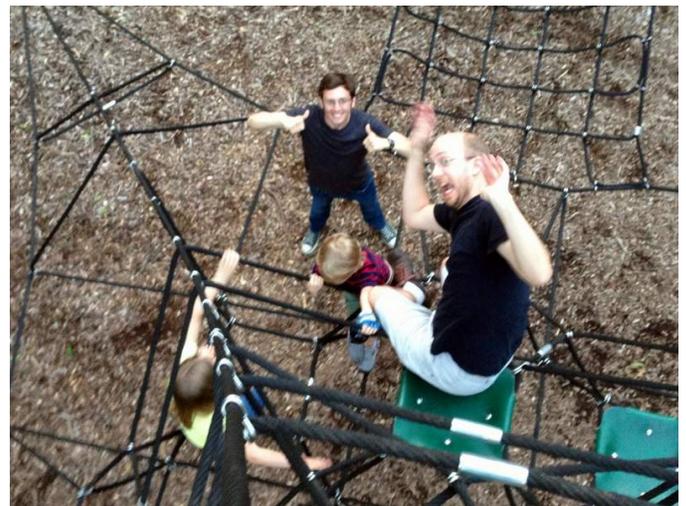
#3: "James working on the DC in the clean room." -Spenser Lynn



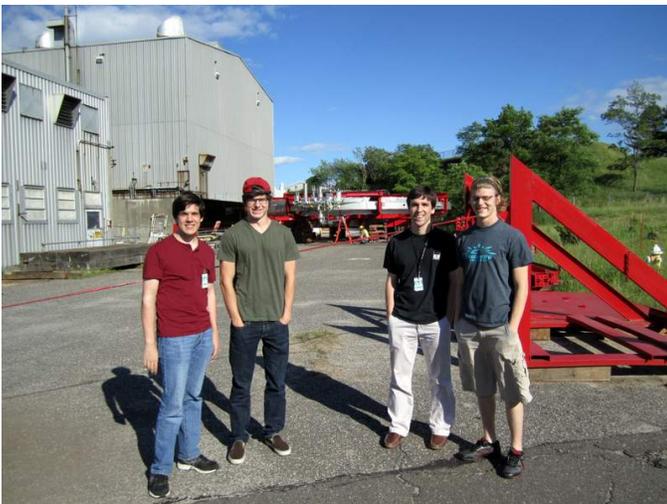
#4: -Dr. Michael Daugherty



#6: "The cleanroom gang." -James Mallon



#7: "Fun at the park." -Chris Campbell



#5: "ACU students prepare to load the G-2 magnet onto the shipping truck." -Andrew Miller



#8: "The ceiling can't hold us!" -Ramsey Towell

Other News

25 Years of Cookies

Lois Marie has served our department for 25 years. Please take a minute to estimate how many cookies she has lovingly baked for us then drop her an email and tell her how much you appreciate her.

New Students

The department of Engineering and Physics expects to welcome over 60 new students this fall. This will be by far the largest group of new students ever for our department and three times the number of engineering students as expected. Plan now to help us welcome them to our department.

Wildcat Video Minute

We are highlighting the Physics and Engineering departments in our July episode of the Wildcat Video Minute. The only footage we are lacking is some shots from the students in New York and Chicago at the laboratories. We will need about ten different shots of students working in groups, close-ups of machinery, classroom setting, etc., to help show the students in action. You can review the script below in case there is something specific at your location that makes sense to film and send to us.

We are hoping you and/or your students can provide us a few shots in the next week or two to work with. iPhones, other smartphones or digital cameras will be perfect. Just make sure to keep the phones turned sideways and shoot horizontally, not vertically. This will match the footage we have shot.

- Keep your shots steady
- Hold on your subject for a good five to ten seconds

- If there is action you think you should follow, please be careful to move smoothly, then wait at the end of the move to steady-up for a few seconds
 - If in doubt, hold your shot
 - Oh, and shoot more than you think you could possibly need.
-

Fall conference

2013 Fall Meeting of the APS Division of Nuclear Physics October 23-26, 2013 Newport News, VA.
<http://www.aps.org/meetings/meeting.cfm?name=DNP13>

New alias for our department:

acu.edu/engineering-physics

Snowmass Young Physicist Survey

Help shape the future of High Energy and Particle Physics research: <http://snowmassyoung.hep.net/>

AAPT T-Shirt design contest (\$100 cash prize):

<http://www.aapt.org//Programs/contests/2013tshirtcontest.cfm>

New Faculty

Dr. Matt Steele arrived in Abilene on May 25. He will join the Engineering and Physics faculty in the fall. Be sure to give him a warm welcome!

The Particle Data Group Announces:

The 2012 edition of the Review of Particle Physics is now available on the Web: <http://pdg.lbl.gov/>

- [Summary Tables](#)
- [Particle Listings](#)
- [pdgLive](#)
- [Review articles](#)

The PDG recommends our website for the public:

ParticleAdventure.org

We thank the 700 members of the particle physics community who contribute to the Review of Particle Physics.

We always welcome your suggestions for improvements.