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# DANGO (Doings and Goings On)- Vol. 22 | Issue 3

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# DANGO (Doings and Goings On)

**Picture of the Week Winner:** "Hot weather and torrential rain caused the ceiling in the control room to leak blue water. I'm proud to introduce Lupe, the hardest working member of the SeaQuest shift crew." –Dr.D


## Group Updates

BROOKHAVEN NATIONAL LABORATORY

*FROM CECILY TOWELL:*

Feliz día de rosquilla Dango,

This week our fearless leader has returned with backup. We are quite happy that my mother has arrived, as we will not have to depend on our own cooking abilities as much. Haley has done enough damage in the kitchen. On Tuesday we began our 8am-4pm shift, and I am once again the DAQ operator. This go around is a bit different from last time since it's during the day when all of the experts are here working. People pester us a lot more, and it's much harder to take a good run of data since they're always messing with stuff. But it is a nice opportunity to ask these people questions and learn from them; they have a slightly better idea of what's going on than we do. We are also continuing our work on the paper about Liquid Fluorine Thorium Reactors during our downtime on shift, which is pretty

often right now. I would also like to report that after years of searching, we have discovered some baby groundhogs. Our mission for the coming week is, of course, to capture them.

May you eat many doughuts,
Cecily

*FROM HALEY STIEN:*
Hi Dango,

This week we started our day shifts at PHENIX and I think I might actually prefer the owl shift. Having experts and generally concerned people hovering over you adds a lot more pressure. However, there is more opportunity for learning so that's one benefit. We're also still working on the paper about Liquid Fluorine Thorium Reactors, so I've been researching the Molten-Salt Reactor Program and their Molten-Salt Reactor Experiment that took place in the 1960's. Pretty interesting stuff! In other news, the Towell clan has arrived. They make us real food sometimes so that I don't burn my quesadillas every day. There is also a caterpillar apocalypse upon us but I'm staying (relatively) calm as long as they do not infiltrate our apartment.

Hope you all had donuts this week,
Haley

*FROM MATTHEW KIMBALL:*
Dear DANGO,

This last week has been utterly uneventful, not that I'm complaining. Legitimately nothing of great importance or excitement has happened. After our adventures last week we settled down and worked on some material Dr. Towell left for us over the weekend. Sunday was the closest thing I had to an adventure when the girls asked if I was ready to go to church without letting me know about the lunch or beach plans afterwards. The beach part fell through (not too mad because khakis and a polo are not even remotely beach clothes) but lunch was phenomenal. To top off an uneventful week, yesterday we experienced an access day and there was no beam for our entire eight hour shift. This has been restful though, so it all evened out.

Sincerely,
Matthew Kimball

*FROM ARIC TATE:*
Hello Everyone,

I am currently in A-town preparing for the drive to NY. As far as work goes, I am writing a report concerning the work I did while at LANL. Yay \LaTeX!

- Aric

*FROM DR. RUSTY TOWELL:*
Hello DANGO,

I hope everyone enjoyed Memorial Day and found a moment to reflect on the blessings we enjoy in this country and the price that has been paid for us to enjoy those blessings. This week most of my

family and I drove from Abilene to Long Island. It seems like this trip gets a bit longer each year. I'm glad I have a couple months before I have to do it again in reverse.

After arriving at BNL on Wednesday, I've spent the past two days addressing administrative red-tape and coordinating the work we will begin doing next week and for the rest of the summer. It looks like we will again work on prototype mRPCs in Mickey's lab. Unlike last year, a lot has been done since we were here last summer including a beam test at FNAL. We hope to build mRPCs made of glass, mylar, and 3D printed material. After building them we will use the cosmic stand we built last year to test them.

Grace and Peace,
Rusty

*FROM VICENTE ROJAS:*

If you got into engineering hoping that there would never be any more writing, editing, or revising to do, you are WRONG.

I am glad to be reporting back to DANGO after a two-year absence. This summer I was hired by Enprotec / Hibbs & Todd (eHT), a local civil engineering firm from Abilene, TX. Something interesting about my hiring process was that I never had a formal interview. I met two professional engineers (PE) from eHT, who are now my bosses, through the events that ACU's Engineering and Physics Department hosted in the Spring semester. I introduced myself to them and asked questions, lots of engaging questions. As a student, if you meet a possible employer and get their contact information, follow up with an email. Show them that you are interested. Also, always have a resume ready with you.

My first day at eHT started out by meeting Daniel, the other intern who I share an office with, and filing paperwork in order to get paid. Afterwards, I got a small project assigned by Jordan Hibbs, PE, who is one of my bosses. He had me work with another engineer. She and I looked at site plans from a water treatment plant at Midland, TX and reported back to Mr. Hibbs. In the afternoon, I met with Josh Berryhill, PE, and had a four-hour long meeting where he brought me up to speed with the different projects that he is working on. There were a ton of acronyms and terminology that I did not know, but I tried to stay with him. It was intense.

I have spent the last three days reading the material that Mr. Berryhill gave me. We are talking about 50+ page reports that engineers at eHT have written. I will soon be writing and revising those reports myself. I feel like I am

studying for a test, but I do not know when the test will be. The Fluid Mechanics, Special Topics Civil Engineering, and Engineering Economics courses that I took in previous semesters are paying off.
When I first accepted this position, I was told that my assignments will vary from day to day. I wish this week was more exciting, but I understand that I first need to study and become familiar with eHT's projects.

I did not anticipate that this would be a four-day work week. After coming back from Torreon, Mexico, Monday's break allowed me get settled back into my house. Aside from my job, I have tried to stay well rested and dry. It has been a rainy week in Abilene.

-Vicente

Fermilab

*FROM ZHAOJIA XI:*
Hello researchers,

This is Tiffany again. At the beginning of this week, I continued working on sqerp. This program is used to compute track momentum using KMAG bend plane deflection and track through FMAG and computer dimuon closest approach. I changed KMAGPTKick value +/- 5% made a plot to show the relationship between different KMAGPTKick values and their charges and momentum. On Thursday Dr.Chen asked me to look into a program which was written by Dr. Chuck Brown. The code is used to check Drell-Yan dimuon pairs, calculate efficiency for hodoscope and other things that I am trying to understand. Also the program was written in Fortran which is a programming language that I have never seen before. I am doing my best to learn and use it, hopefully I will be able to improve this program.

Talk to yall soon,
Zhaojia(Tiffany) Xi

*FROM CALEB HICKS:*
<generic salutation>:
Another week without much to report. I don't have the nice owl shift hours anymore so I have to be awake during the day. I feel like I could sleep for about 28 hours straight. We're supposed to get projects to work on, but so far we haven't heard anything. I've just been taking the time to brush up on c++. We've also been learning a lot about nuclear physics, so that's good too.

<generic send-off>,
Caleb Hicks

*FROM JOSHUA MARTINEZ:*
Wassup DANGO,

This week as of now was rather uneventful. Memorial Day was nice to have off and a good start to the week. Tuesday was just a regular day and

besides the weekly meeting nothing interesting happened. Wednesday we had a talk about Dark-Photons which was rather fun. We also went to a talk about the SSC (Super Colliding Super Conductor) and who was responsible for its downfall. Thursday we had a really great lecture from Dr. D about Linux and my virtual machine that I learned a lot from. Currently (Friday) I am giving myself a crash course in C++ coding language and will continue to do so over the weekend. I believe around 1:00 pm today I will be helping SeaQuest replace/upgrade a high voltage power supply in the beam tunnel, I am looking forward to that. As much as I love sitting at my laptop pressing keys and making code it will be great to finally get out of this chair and do some hands on work. Until next time DANGO.

Sincerely,
Joshua Daniel Martinez

*FROM PAUL CARSTENS:*
Not dead yet!
With Memorial day off and Friday not done yet, it's been a short week thus far and there isn't much to report. We've had our usual lectures from Dr.s I and D on physics, electronics, and computer science with the most notable being an explanation of the weak force that wasn't just "this is the force you don't explain to your non physics friends". The only task I've had this week was repairing two more HV serial cables with Reuben's assistance.

In other news, it looks like we'll all have projects soon! Most likely two of us will be assigned to work on the dark photon experiment and the rest will be repairing the jTracker program.

*FROM REUBEN BYRD:*
Hey Dango,
This week we got a little more insight into what we will be working on over the summer. Paul and I will be working with sqerp and trying to get that back up and running. This is the event tracker, but the creator left, so it hasn't been in use. Hopefully we'll get it working! On Friday we also replaced on of the high voltage crates, we had to where hard hats and everything, it was the whole shubang.

'Til next week,
Reuben

*FROM DR. MIKE DAUGHERITY:*
Hi DANGO,

We will always try to make a plan and guess what we'll be doing at the labs, but we never really know. We find out what things need to be done and what things we think we can do, and hope that there's an overlap. This week revealed that we'll be spending our summer tracking things through SeaQuest. In addition to picking up the responsibilities of running SQERP for the collaboration, we're also getting started on something a little more exotic.

SeaQuest is designed to track muons. The proton beam splats into the target and the five meter block of iron behind it producing several kajillion particles, many of which can decay into muons. Every now and then we see a pair of muons coming from the target and by measuring these we learn about anti-quarks in the proton. But suppose the muons can from somewhere else. One theory (which is crazy or brilliant, or perhaps both) is that dark matter could produce muon pairs well behind the target. If we can figure out how to look for these, then we can say something about whether or not "dark photons" exist.

So, it wasn't part of the original plan, but ACU is now in the dark matter business.

-Dr. D

*FROM DR. DONALD ISENHOWER:*

Dear Dangoland from Dr. I. at Fermilab.

My time has been continued to be spent repairing LeCroy 1440 High Voltage systems. On Thursday morning I reached my goal of having two complete systems, plus two extra controllers so that a system could go back in to put us back in normal operating mode. Once I announced that, it was decided to get them in ASAP, which is non-trivial because it has to taken down to the pit with the crane and only two people have the training to use it. One is on vacation and the other was sick, but we got it arranged for Friday at 1 p.m. (the one who was sick agreed to come up to do it). So Caleb helped me for an hour or two Thursday putting in the HV modules exactly as they would be used for the H2 hodoscope plane, putting in the HV values, and measuring all the actual values to make certain that every channel worked correctly. Of course a problem cropped up, but I had that solved by 9 p.m..

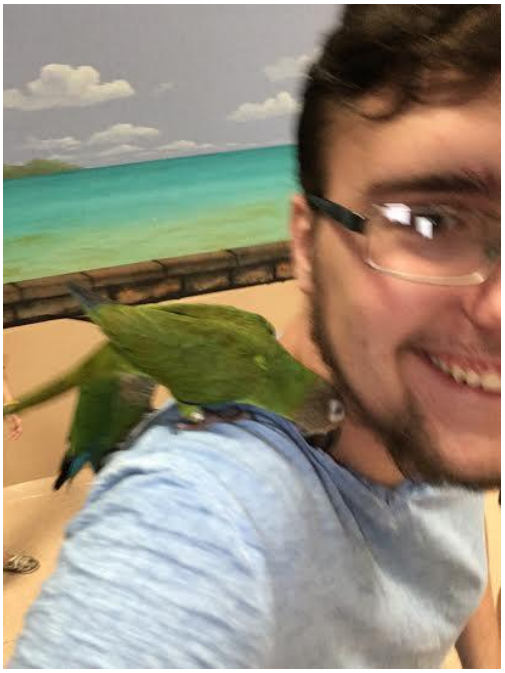
Friday morning, knowing these supplies are unreliable, I prepared a second crate exactly like the previous one and verified all channels. The students got to help crane it in Friday afternoon. We hooked it up to the network and ….. it didn't work. So I went back got a spare controller and then got it up and running. So just the bouncing of moving it downstairs was enough to cause that module to fail, reinforcing my warning of the need for spares. Caleb helped move the cables from the temporary system back to the reinstalled system and everything came back up. Some hodoscope channels that we thought we were having problems with turned out to be due to the temporary system, so I was the hero of the moment. I stayed until 8 p.m. to be available to go back in and fix any problem that cropped up. I've fixed 3 controller modules in the last couple of weeks, where Fermilab has not been able to repair any in the last 9-12 months. I'm working on repairing other modules, but they're different as they are the ones with sections that are lethal if you touch the wrong place. :-)

People have suggested as there are now no sites that can repair these power supplies and that there are still lots of experiments still using them that I could start a business repairing them. My response is that they would have to be willing to pay very dearly to get me to do this for anybody else!

-Dr. I. the elder

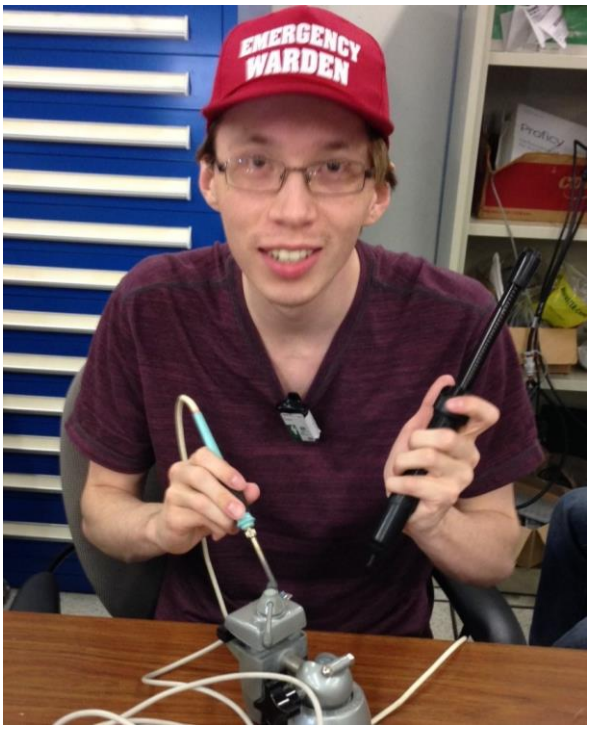
## Picture of the week candidates

Matthew: "Mobbed by tickling birds."



Zhaojia: "Geeeeeeeese"

Dr. D: "Paul in a funny hat!"



# Coffee of the Week

SagTown Coffee- Caramel Macchiato


✉ hxs12a@acu.edu