EE 491 Weekly Report

Week 2: 9/2-9/8

Group: *May14-03* **Advisors:** *Dr. Sumit Chaudhary, John Carr* **Client:** *ISU NanoLab*

Members: *Andersen, Martin; Diallo, Mouhamadou; Rodriguez, Nicholas; Straquadine, Joshua*

Project Title: *"Design and implementation of cryogenic current measurements on organic photovoltaic cells"*

Weekly Summary

The main goal this week was to get a good handle on the scope of our project and start moving in the right direction. We compared schedules, set up regular group meeting times (7:00 PM Monday and Thursday) and had our first meeting with our advisors.

Meetings

Because we were only in the startup phase of our project, we only had one meeting this week. The rest of our time was spent familiarizing ourselves with the subject matter.

9/4 Group Meeting with Advisors

Duration: *45 min* **Members Present:** *All*

Purpose and Goals:
Establish contact with both advisors, define project deliverables, answer logistical questions, and make sure everyone is on the same page

Achievements:
As a group, we defined exactly what was expected of us over the course of the project:

- To ensure that the proposed cryostat is able to reach temperatures of 80 K
- To develop a way to accurately measure the temperature in the cryogenic range
- To accurately and reliably measure low currents (pA resolution) in a noisy environment at low temperature
- To control the temperature systems and current measurement systems through a computer interface (most likely LabVIEW)
- To automate the data collection process

We also received answers to our questions of where, when, and how we would complete our work. We will begin by focusing on the first deliverable, which is understanding and verifying the functionality of the cryostat. Our advisor supplied us with a digital copy of a book (*Building Scientific Apparatus*, by Moore, Davis and Coplan, Cambridge University Press, 2009) with some information on low temperature measurement and control as a first step in our research.

Pending issues

1. Logistics of getting into the lab – The MRC is only open from 9-5 on weekdays. This is a serious logistical issue, because as a group, there are very few times where we can all meet together during the day. Most likely, we will need to be completing our work in pairs or groups of three, but will need to find a way to keep the members not present in the loop.

Plans for next week

1. Familiarization with laboratory equipment and subject matter: none of us have ever worked with a cryostat or organic solar cells, so we all have a lot to read in order to understand the finer points of the project
2. First in-lab group meeting to begin examining the cryostat and developing a plan to verify its operation
3. Group meetings in which we share what we've been reading about the material so that we all stay informed, and where we begin putting together our project plan

Individual Contributions

Andersen, Martin: Attended the meeting, research (1 hr)
Diallo, Mouhamadou: Attended the meeting, research (4 hr)
Rodriguez, Nicholas: Attended the meeting, research (1 hr)
Straquadine, Joshua: Attended the meeting, research (6 hr)