**Automatic Water Sampler Proposal**

Hi Garage@EEE, I have a small one-time project that your club may be interested in! I will need to build this automatic water sampler to aid in the sampling during my final year project and I was hoping to get the help of students in Garage@EEE. I have little background knowledge in coding Arduino boards or how to calculate the various power requirements or set up the entire system in general and was hoping that your club could help. I will most likely be able to secure funding for the project and may even be enough to pay the students a small amount for the help. Below is a summary of the problem I have and some of the things I have thought about already. I hope to hear back from you soon!

Scenario:

I am a final year Environmental Earth System Science student at NTU working on my FYP. I have a 2L container of phytoplankton being cultured in different light cycles (example; 12hr light:12hr dark, 16hr light:8hr dark). It is stored in an incubator kept at 22 degrees. Every 2hrs for 7 days, I need to take a 3-4ml sample from this container and store the sample at 4 degrees in the dark to stop the growth of the phytoplankton. At about 8hr intervals, I will come and collect the samples to be processed and replace the used sample containers with fresh ones.

Tasks needed for the project:  
- siphon a small quantity (3-4ml) of water from a larger 2L container every 2 hours into separate aliquots.

Suggestions:

* Using a rotating disk plate with a stepper motor to move the sample vials into the correct position
* Use a peristaltic pump to move the water out and into the vials

- The sampled water should be stored in a water bath at 4 degrees celcius using a water bath for even temperature distribution

Suggestions:

* Peltier plates with temperature sensor controller with feedback loop?

- The tubing has to be cleared and purged before each sample is taken to prevent contamination between samples. As the 2L reservoir will need to last for a period of 7 days with samples every 2hours, the purging cannot take up too much quantity. Another option would be to purge with clean distilled water from a separate reservoir.

Suggestions:

* Maybe some solenoid valves to control the opening and closing of the different tubes to allow cleaning between samples?
* Or using the peristaltic pump to pump back samples in the tube after sampling before purging with distilled water from a separate container

Attached is a picture of a rough design that I worked out.

A close up of text on a white background

Description automatically generated

The next few pages are the report for the original DIY sampler made in 1998, so an updated one that uses newer technology like an arduino board would be preferable.