Irene Hu Sorted By Project

701160 - Year 4 Sensors

- Minor troubleshooting for broken controller (Week 6)

701160 - Year 5 Sensors

901217 - Chemical Sensors

- Troubleshooting issue with revC baseboard vs revB, traced to BME280 addressing in code (Week 2)
- MSC3 baseboard revD is being made my Indtec (Week 2)
- Look into mounting holes issues, will be updated for baseboard revE / Tiva1290 module revB (Week 2)
- Getting Jess's Python code working with MSC3 output (Week 2)
- Planning for new baseboard with holes matching new toolsled, and new module with coordinated holes that also fits mini ISUS (Week 3)
- Random help for Thom in troubleshooting code, as needed (Week 3)
- RevD baseboards received from Indtec last Wednesday. Quick troubleshooting on extra current draw, traced to a rotated part (Week 4)
- Discussions and some minor updates to next Tiva module (Week 5)
- Bitbucket+VSCode tutorial to get Jess's MSC Sampler code onto Bitbucket (Week 5)
- Some updates to next Tiva129 module, eg fix I2C issue noticed by contractor (Week 6)
- Tiva1290 rB modules complete and sent out for quotes; looked at interference w/ baseboard rD; various meetings and decisions on which versions of baseboard to go forward with, when (Week 7)
- Tiva1290 rB sent out to Indtec (Week 8)
- Tiva1290 rB modules received, troubleshooting programming. JTAG header is wrong and one net disconnected (Week 11)
- Troubleshooting SPI bus issues for pH measurements with 1290 processor - CS had been reassigned from GPIO to using uP's SPI functionality, causing timing and/or other issues (Week 12)
- Support for code development (Week 14)
- Chasing through problem with MSC3 baseboard powered at 8V with current limit (battery end of life behavior). Current draw from starting up deuterium lamp affects system in a more fatal way than it did for MSC1. (Week 15)
- Chasing down MSC3 behavior at low voltage with a current limit / low voltage with source output resistance (Week 16)
- Assisting with various troubleshooting and coding tasks (Week 19)

- Circuitry updates to address high latent power draw, bad EOL battery behavior (Week 19)
- Battery drawdown and power consumption tests (Week 19)
- Various coding tasks and troubleshooting handed off by Thom (Week 20)
- Various power and timing measurements (Week 20)
- Help with code troubleshooting for MSC3's final push (Week 21)
- Power, bootup time, etc measurements for MSC3 (Week 21)
- Random support, e.g. measuring timing of different processes, current measurements, troubleshooting broken boards (Week 22)
- MSC3 bug fix: traced to print buffer overload with high spec readout (more digits) (Week 23)
- Help troubleshooting MSC3 - broken spec, broken mcap, etc (Week 24)
- Trained Luke and Josh to program chips for MMS boards (Week 27)
- Helping to troubleshoot noise issues with pH for MSC3 (Week 30)
- Trying to troubleshoot MSC3 noise in PTC chamber (Week 31)
- Ongoing tests to track down pH noise with MSC3 in PTC (Week 32)
- Continuing experiments with noise on PTC (Week 33)
- Mini ISUS prep and planning, wiring diagram (Week 34)
- Continue w/ PTC experiments (Week 34)
- Wrapped up PTC experiments, recommend using battery power (Week 35)
- Minor help with TIP can (Week 49)

901805 - Coastal Biogeochemical Sensing Program

- Reviewed alkalinity sensor documentation (Week 2)
- Mini ISUS baseboard recreated as modification of MSC3 baseboard revD (Week 2)
- Interview for research specialist position (Week 2)
- Reviewed alk circuit again, talked to Ellen Briggs (Scripps), reviewed materials she sent (Week 3)
- Working on getting lioncap and NC-Nanofet to Ellen- need to check out boards (Week 3)
- MiniISUS: trying to figure out what's going on with lamp (model in hand doesn't match documentation in hand) before can proceed (Week 3)
- Trying to get together boards and package to send to Ellen Briggs at Scripps for Alkalinity sensor; troubleshooting some issues with bad signals (cable was backwards) (Week 4)
- Working w/ Jose on non isolated Nanofet board (Week 4)
- Coordinated w/ Jon about Mini-ISUS layout specs (Week 5)
- Reviewed more resumes (Week 5)
- KAUST call (Week 5)
- Non-iso nano is ordered and on its way (Week 6)
- Finally got mini lamp info after Photonics West meetup. Updated circuit for mini ISUS baseboard, Jose went back and forth with Jon re: layout (Week 6)
- Continue trying to understand alkalinity circuit (Week 6)
- Mini ISUS baseboard finished and sent out for quotes (Week 7)
- Discussed alk sensor with Ellen during her visit, handed her boards (Week 8)

- Started on alk circuit (Week 8)
- Outline of alkalinity circuit, ordered things for breadboard experiment (Week 9)
- Mini ISUS fit test reveals backwards connector (Week 11)
- Prototyped alk circuit on breadboard (Week 13)
- Tested breadboard alk circuit using resistors for load, plotted data (Week 14)
- Made connectors for mini ISUS; testing and troubleshooting. 50pin header is reversed and one baseboard seems to have assembly errors (Week 14)
- Latest issues with mini ISUS prototype traced to using unprogrammed spec boards in assembly. Fixed this and finally got a scan! (Scan has a blip) (Week 15)
- Worked through process for programming spec digital boards. Worked with Ben a little on MSC3 code he needs for tuning analog boards. (Week 15)
- Presentation on electronics for lab meeting (Week 21)
- Alkalinity board: tests with electrodes in NaCl water, finished board design (Week 22)
- Finished first draft of alkalinity board (Week 23)
- Breadboard test of negative current source, worked (Week 23)
- First draft of code for ADC and DAC (Week 23)
- Mini ISUS build BOM (Week 24)
- Start organizing to order boards for mini ISUS, mods as needed (Week 24)
- Working with Joe on getting lamp attached to mini ISUS baseboard for first prototype build (Week 25)
- BME280 errors on mini ISUS baseboard traced to soldering issues. Baseboard checks out again, succeeded in running overnight scans (Week 26)
- Pushing through mini ISUS parts orders (Week 26)
- Checked over phAt board layout and approved! (Week 29)
- mALK board sent out, working with Jose to update mphox revC (Week 31)
- OSM abstract (Week 35)
- Alkalinity board received, working on code integration with updated mpHOx code (Week 35)
- Updated code for alkalinity and fixed some compile errors; trying to debug an mphox rB for testing (Week 36)
- Check in on mini ISUS- one fiber is a little too short (Week 37)
- Mphox rB broke, waiting for rC to test alk board (Week 37)
- First draft code for alkalinity sensor, after discussing new code structure with Jim Davis. Doesn't work yet. (Week 38)
- First draft code for ISUS fast sampling, for mini ISUS deployment on CTD (Week 38)
- Working version of alkalinity code; electronics confirmed to work, now cleaning up code (Week 39)
- Mini ISUS assembled and uploaded with new fast sampling code. Trial run of 20 min had too much heating inside, will try again in test tank (Week 39)
- Reorg'ed code for mpHOx revB, wrote and tested alkalinity + pH code (Week 40)
- After coordinating cables with Joe, mini ISUS 001 was deployed in the test tank. Data looked ok, still too much heating. (Week 40)
- Chasing down inaccuracies in reported current of alkalinity circuit in ranges we care about, may need to switch circuit design (Week 41)

- Tests of mini ISUS in seawater lab chilled line: show some temperature effects in raw data, but processed nitrate seems ok (Week 41)
- Simulated new and old circuits with pspice, updated circuit for improved current measurement (Week 42)
- Updated alkalinity code to handle pumping (Week 42)
- Continued support for mini ISUS tests (Week 42)
- Continual monitoring of mini ISUS dev - deployed on Monday on ROV w/ DISCO dive (Week 43)
- ISUS data processing from ROV dive (Week 44)
- Alkalinity test set up in lab, produced a titration curve after some troubleshooting (Week 45)
- Discussed Nanofet v2 w/ Brent and Yui, looked over Brent's design (Week 45)
- Review nanofet 2 board design (Week 47)
- Ordered some things for alkalinity experiment (Week 47)
- Continued work on alkalinity sensor. Code updates to speed up. Collect data and process to detect inflection points, but setup is imprecise so inflection points don't always show up. Code update for file write but FatFS seems broken. New rev B board works well but shows a consistent 2-3% error in current generation, trying to troubleshoot (Week 49)
- Continued work on alkalinity sensor (Week 50)
    - Troubleshooting w/ contractor Jim's help to fix filesystem issues w/ mphox rB (Week 50)
    - Data processing to try to extract inflection point, found faster data needs block average so might make sense just to measure slower (Week 50)
    - Troubleshooting and calcs on current source for 2-3% error. Has to do with Howland pump nonideal behavior, will do some tests once a more precise lab setup is ready to determine how much of a problem it is (Week 50)
    - Designed some parts in Solidworks to hold floating anode design (Week 50)
- Alkalinity: Iterating on 3D printed parts for floating anode design (Week 51)
- Getting boards ready for alkalinity tests (Week 51)
- Continued work on alkalinity flowcell. Latest version has been tapped for Durafet, alignment is more off than expected and may iterate. Contemplating a lid. (Week 52)

901904 - Deep-Sea Coral-Sponge Community Observatory

- Discussion meeting and some follow up tasks in coordination with Paul (Week 3)
- LED ring mockups to try to cram as many LEDs as possible in a symmetrical way (Week 4)
- Graphed a lot of LED and other spectra to help pick LEDs (Week 4)
- Reviewed Paul's circuits (Week 4)
- Circuit review w/ Paul (Week 5)
- Compile more LED info, donut hole LED pattern (Week 5)
- Researched some more LEDs (Week 6)
- Code planning and other discussions w/ Paul (Week 6)
- Trying to order some LEDs using new accounting system (Week 7)

- Some discussions w/ Paul re: circuits and code; set up new code on bitbucket (Week 7)
- Working on code (Week 9)
- Writing code (Week 11)
- Continue writing code (Week 12)
- Working on code for SWIR camera (Week 13)
- Added more features to SWIR code including linear actuator (PWM based), current measurement (INA209), get system data (Week 14)
- Commands list and list of tests (Week 14)
- System diagram (Week 14)
- Testing SWIR software with controller; after minor troubleshooting, seems to work (Week 19)
- SWIR multispec front light working with camera, minor troubleshooting (Week 20)
- Code for coordination with backlight (Week 20)
- Code for UDP comms (requires some restructuring of other code) (Week 21)
- Testing controller-controller comms, servo motor PWM code (Week 21)
- Tests with internal linear actuator; PWM is not working (Week 22)
- After extensive troubleshooting, PWM-based linear servo works; issue with library not working well with 8-bit timers, switched ports to 16-bit (Week 23)
- Looked into RS485 for external motor (Week 23)
- Working on small RS485 interface board for motor driver (Week 31)
- RS485 interface board almost done in Kicad (Week 32)
- RS485 interface board sent out for fab (Week 33)
- Troubleshooting controller-to-controller comms (Week 33)
- Started work on wiring diagrams (Week 33)
- Troubleshooting controller-controller comms; software and hardware issues (Week 34)
- Wiring diagram (Week 34)
- Various whack-a-mole troubleshooting for two board stacks (Week 35)
- Troubleshooting connector issues (Week 36)
- Dual-controller comms and coordination seems to be working (Week 36)
- Comms to motor controller from cpu via RS485 board works; made various cables (Week 37)
- Code for motor controller (Week 37)
- System diagram updates (Week 37)
- Troubleshooting for various problems including motor controller (Week 38)
- Motor controller works, finished troubleshooting non-working channels, UDP comms, etc (Week 39)
- Help Paul with chassis wiring and various troubleshooting after wiring, updated documentation (Week 40)
- Helped with various tests of assembled system in air and tub, things look pretty good (Week 41)
- Test of hugger with Ventana on Friday (Week 42)
- Deployment of coral hugger on Monday went well (Week 43)
- Python GUI for the coral hugger (Week 44)

- Continued work on Python GUI adding comms text log, environmental sensing, various widgets (Week 45)
- More bells and whistles added to GUI, ready for testing with actual controller (Week 46)
- GUI worked surprisingly well with controller over UDP comms; various troubleshooting, especially related to motor (Week 47)
- Assembled some photos / videos for engineering update (Week 50)
- Tested GUI with full setup including camera, some bug fixes (Week 51)
- Measured some blank targets for white balance / normalization (Week 51)
- Bells and whistles to GUI so it can handle closing and opening window while system has already been in use. Required redoing some of back end. (Week 52)
- Attempt to normalize reflectance image to Spectrolon blanks, still ongoing (Week 52)
- Troubleshooting an unusually high temp coefficient in LED current that appeared during blank tests. Traced to slightly incorrect use of DAC (Week 52)

902305 - Event Detection Using the Sedimentation Event Sensor

- Reviewed wiper situation based on photos (Week 7)
- Meeting (Week 23)
- Started organizing notes for “manual”, updated battery sphere - MARS schematic for Sense wire issue (Week 24)
- Compiling notes and rewatching videos to put together turnaround document; various handoffs from Paul (Week 25)
- Picked up SES and TT on Monday (Week 26)
- Start troubleshooting TT modem (Week 26)
- Start SES conversion to MARS, beginning with SIIM can conversion (Week 26)
- Turnaround SES for MARS - modifying SIIM can for new MARS without 48V (Week 27)
- Troubleshooting modem (Week 27)
- Acoustic modem sent back to Benthos because receiver doesn’t work (Week 28)
- SIIM can finished refurbishment, tested with power supply and works (Week 28)
- Converted battery sphere to MARS mode, tested with power supply and seems to work (Week 28)
- Help with prep for deployment; final decision on trigger trap is not to send it down with the directional modem, due to lack of confidence (Week 29)
- Deployment of SES at MARS on July 16 (Week 29)
- Clean up after last week’s deployment, follow up with Benthos (Week 30)
- Finished updating schematics and turnaround howto guide (Week 30)
- Modem drama, but hopefully it arrives back from Teledyne in the nick of time. (Week 34)
- Trigger Trap deployed at MARS after a last minute push with modem arriving in the nick of time (Week 35)
- Meeting (Week 39)
- Carson recovery on Monday 11/10; all recovered successfully, but TT carousel was stuck (Week 46)
- Biweekly planning meeting (Week 52)

Out of Office

- Dec 25 - Jan 2: vacation
- Feb 26 - Mar 9: vacation
- 1/17: MBARI forced to WFH due to fire; 1/22, possibly 1/23: WFH
- Jan 28: Photonics West
- Jan 30: WFH
- Feb 10: WFH
- Mar 10: out sick
- Mar 13: WFH, doctor's appt
- Mar 14, 17: out sick
- April 10: dr appt, WFH
- 5/13/25: Dr Appt
- 5/12/25: Dr Appt
- 6/27-7/4: vacation
- July 15: drs appt
- July 16: Carson
- July 21 - 25: intermittently out of office due to flood at home, need to move
- Aug 1: WFH
- Aug 12: WFH
- Aug 11-15: out one day TBD to move
- Aug 15: out of office, moving
- Aug 21: Carson day
- Sept 1 - 5: vacation
- Oct 7: dr appt
- Nov 5-6: WFH / vacation
- Nov 24-28: vacation

Overhead

- Closed out rec com budget for 2024 and set up spreadsheets for 2025. Made a draft budget. (Week 2)
- Rec com budget (Week 3)
- Procured lots of snacks for Lunar New Year cookie break (Week 4)
- LNY cookie break (Week 5)
- Chad's design review (Week 9)
- Rec com meeting (Week 9)
- Finally moved offices (Week 11)
- Missed my own pie event =((Week 12)
- OBS research specialist interviews (Week 13)
- OBS research specialist interviews (Week 14)
- Helping to fly drones (Week 24)
- Working with Erik on ORP sensor for Dorados. Connected sensor to modified mcap for some preliminary measurements (Week 25)
- Random help with UAVs (Week 25)

- Continued measurements and data processing for ORP sensor (Week 26)
- Bike to Work emails etc (Week 31)
- Aug 5: Bike to work (Week 32)
- Rec comm meeting (Week 37)
- MBuddy training session (Week 37)
- Rec com meeting and lots of charge processing (Week 42)
- Rec com BBQ 11/12/25 (Week 46)
- Rec com budget- finally got Paid Detail to compare transactions (Week 47)