

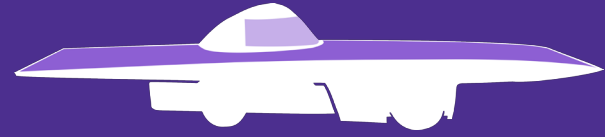
NU solar

Driven by Innovation, Fueled by the Sun

Winter Quarter Newsletter, December - March 2016

We have survived another Northwestern Winter and have emerged ready to start the build process for our next car. In addition, SC6 has received a much-needed mechanical alteration to its canopy and has had the electrical system torn out, cleaned up, and reinstalled with new temperature sensing boards. We also participated in the Winter McCormick Career Fair and gained a few new team members. See you after spring break!

— Alexander Martin
Associate Project Manager



SC7 Frame and Suspension

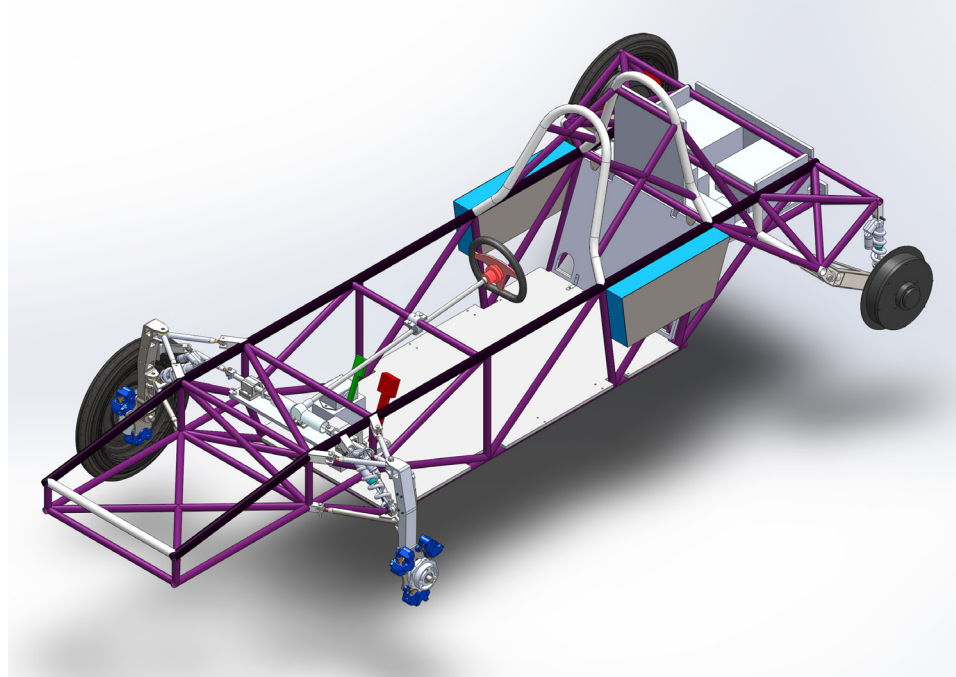
In winter quarter we finished the design of the critical components of SC7, including the frame, front and rear suspensions, as well as the steering system. We had a design review at the end of the February with our team’s advisors, and are preparing to send the order for the frame tubes by spring break.

We will begin piecing the frame together in Spring Quarter. Our mechanical members are currently practicing machining and welding so that we have the skills required to assemble the frame.

For those that are interested, these are the technical specifications for the new frame:

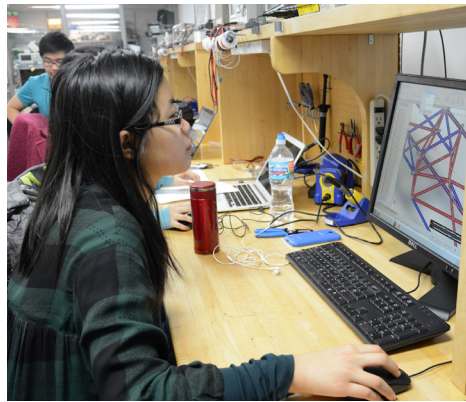
- Tube OD: 1” and 1.25”
- Tube wall: 0.035”
- Tube count: 101
- Weight: 80 lbs
- Dimensions: 121 x 72 x 36 in.

The design of the carbon fiber shell of the car is being done as an independent design project by two masters students and Professor Neelesh



Patankar, a professor of fluid dynamics at Northwestern. The shell design will be completed in spring quarter and we will begin the process of manufacturing the mould so that we can do layups next Fall.

➔ Team member Betsy Chou works on the car assembly at one of our weekend work sessions. Betsy is also part of a design team that will be traveling to Jamaca to perform user testing in Spring Quarter.



Mockup Building

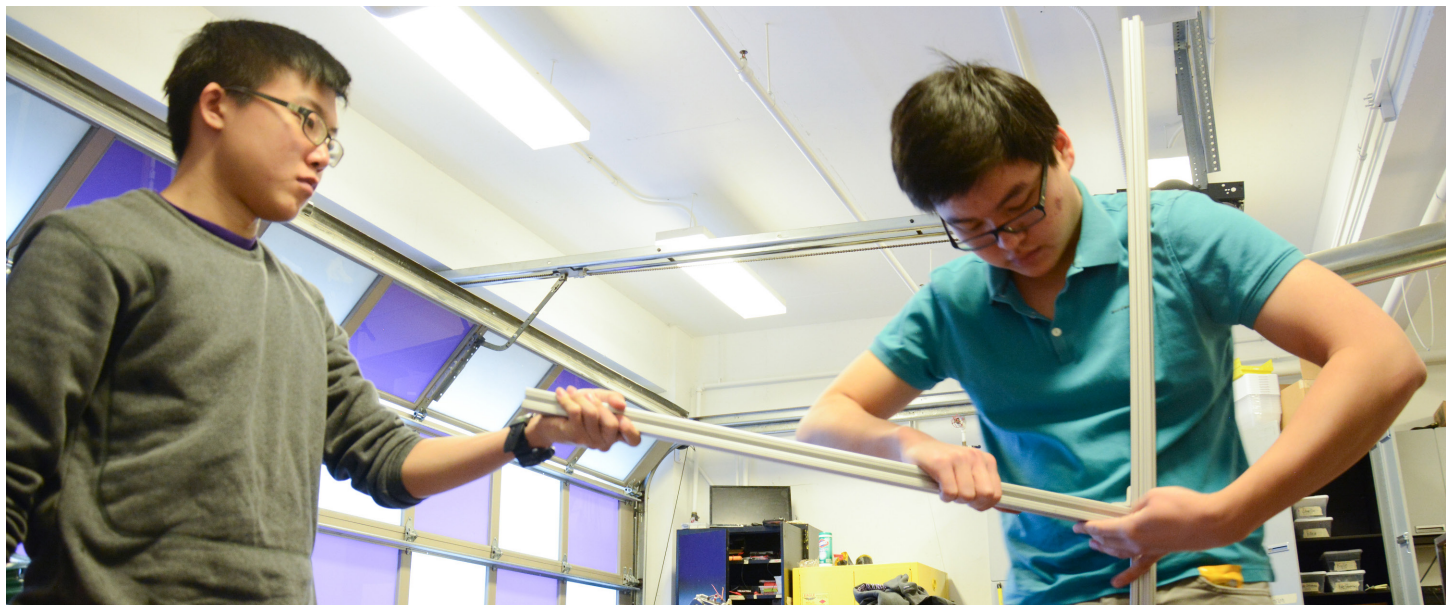
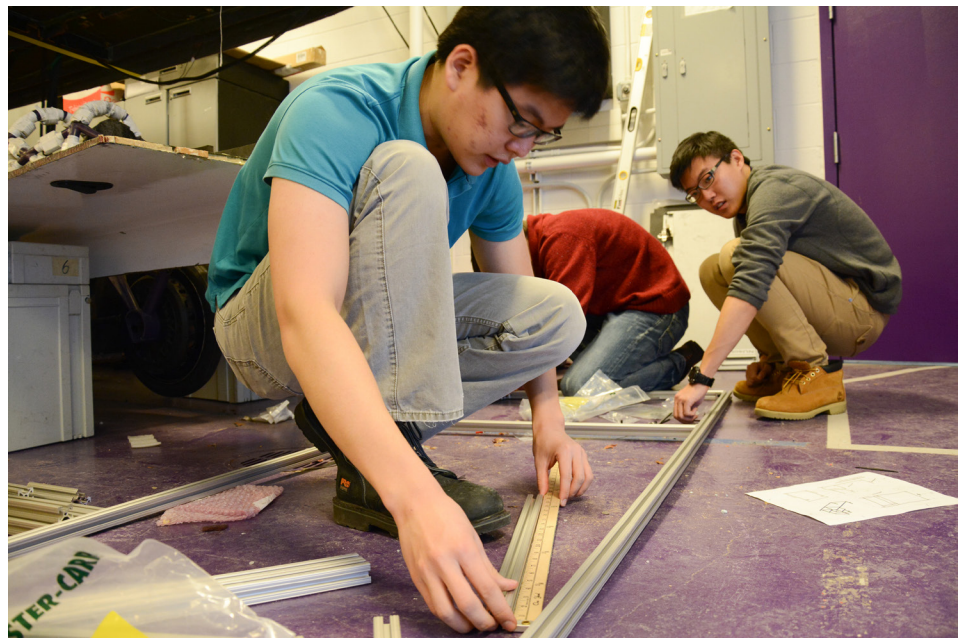
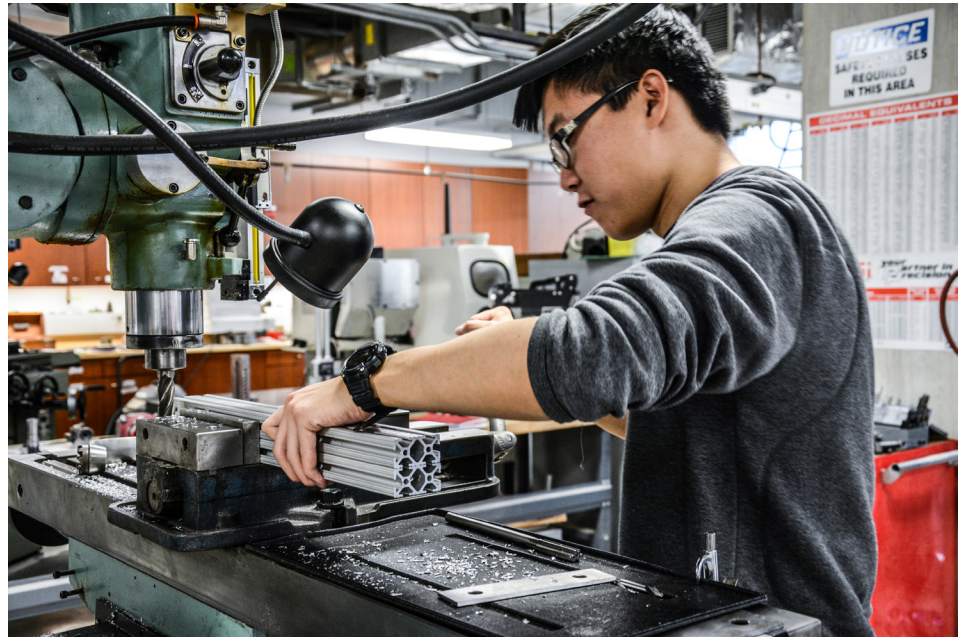
Charles Wang, a new team member this quarter, worked on building a basic mockup of the next car's geometry out of 80-20 aluminum extrusions.

The manufacturing process for this mockup also involved some machining, so Charles and a few other members were trained on the mills and used them to cut out holes in the aluminum.

This mockup proved very useful in allowing us to test the driver seating position, the height of the roll cage, the location of the steering wheel, gas, and brake pedals, and various other design elements related to driver ergonomics.

The use of 80-20 allows the mockup to be fully re-configurable so we are able quickly change positions of various "components" to see how it improves or worsens the driver experience. This modularity is especially important because our drivers have a wide range of leg lengths, so we need to make sure no one driver is too uncomfortable in the car.

We plan to continue to incorporate new elements of our design into this mockup on an as-needed basis.



SC6 Canopy Project

Mechanical Engineering sophomore Austin Han has been making improvements to SC6's canopy this quarter. The previous design had a very flimsy connection between the canopy and car, and resulted in the canopy rubbing every time it was opened.

Austin's new design improves the stiffness of the connection and ensures the canopy is properly supported on the top shell. This will prevent future damage to this area of the car.



One of the challenges of this project was the fact that the solar cells on the top of the canopy limit where we can put attachments, and the roll cage prevents the use of a single hinge bar all the way across. To solve this, we used two hinges supported cantilever-style by reinforced ribbing (above).

Member Highlight

One of our newest members is Emily Feng (right), a freshman in mechanical engineering from Issaquah, WA. Emily is passionate about solving real world problems, especially issues related to sustainability, which is why she decided to major in engineering.

Emily says she chose to come to Northwestern because she was really interested in the DTC program that freshmen get to take. She says that that kind of early-on design experience was unique to Northwestern and something she wanted to do.

In addition, she has relatives in Chicago and loves its culture and many of its well-known attractions including the Art Institute and the CSO.

Emily joined NUsolar because she wanted hands-on experience in things related to her major and to green technology. On the solar car team, she is currently working on the crush zone design for SC7. In this project, she'll gain experience in CAD modeling, materials selection, impact testing, safety analysis, and low density material manufacturing methods.

Outside of NUsolar, Emily studies piano as a non-major and is preparing to perform in the non-major music recital. She is also serving as the academic chair in Chapin Residential College and hopes to graduate with a minor in creative writing.

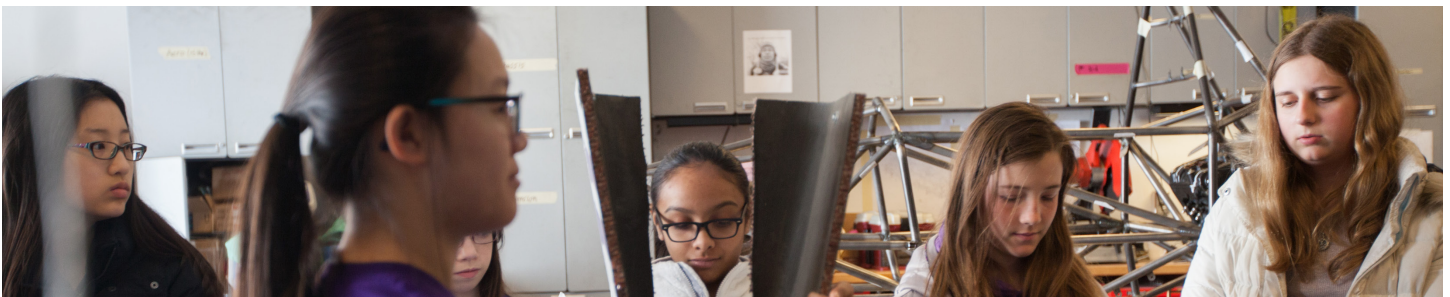


Photo Credit / Emily Feng

Winter Outreach Events

This quarter, NUsolar hosted three outreach events for local elementary school students. We gave two tours of the autobay, and members Ben Donahue and Alexander Martin gave a presentation about NUsolar at Dewey Elementary School in Evanston.

The kids who came to the presentations reacted positively and had lots of interesting questions, including "Why don't you build a lunar car?" and "How do you get into the car?" (a very important question!)



Have questions or comments? Want to get involved? Visit us online:

www.nusolar.org

www.youtube.com/user/nusolar

www.facebook.com/weracesolarcars