Read about how Nova Labs is helping during the COVID-19 pandemic.

Journey to the FTC world championship.
President Sam Aparicio addresses the community.
Quilting as an artform and more.
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As you are probably aware by now, the Nova Labs Board of Directors made the difficult decision to temporarily close our makerspace Wednesday, March 18, 2020 in the interest of protecting our Northern Virginia community. We had moved to merely close Nova Labs to non-makers the week before while wiping down surfaces twice daily. But with disinfecting supplies running low and replacements becoming more difficult to find, and volunteers worn thin trying to maintain the space, we chose to move our operations online until the coronavirus crisis is over.

Online? As many of you know, we have a vibrant Slack community with channels for each of our different maker interests. We also have #random, a channel for posting comics, jokes, and interesting news. Don’t forget #show-us-what-you-got, a channel devoted to photos and videos of maker projects. We want to see what you are making at home! If you find yourself in need during this crisis, please post to #i_need_help.

We are also experimenting with the world of Discord, since Slack lacks video and audio conferencing. Teenagers are very comfortable with Discord, which is often used to coordinate players in the gaming world, but we are hoping it can help our makers continue to “see” each other for role-playing and board games, conversation, and making.

Clearly, we can’t offer our normal hands-on classes for projects and sign-offs while Nova Labs is shut down. So we are experimenting with live Zoom classes and events in the interim. On Friday, March 20, Craig Trader held his traditional Game Night online. The next day, we offered the first Kids’ Open Maker Virtual Meetup. Bo Pollett, fearless innovator and pro-maker, was our first online instructor with an introductory OnShape CAD class. Sam Aparicio, Nova Labs’ president, is continuing his weekly Fireside Chats, but in virtual form. Our Raspberry Pi, Robotics, NVIDIA, Arduino meetups and other meetups are still thriving online. Karen Shumway, Samer Najir and Natalie Abrams also quickly stepped up to offer classes in soapmaking, composites, and art. Most Zoom classes are free to members, $20 to non-members; pricing designed to sustain our creativity and community while waiting out the contagion in our homes. Technical glitches may arise, but makers are building the plane while flying, not pausing to get things perfect first.

Nova Labs is determined to re-open when we can, and to continue our mission to help the D.C. Metro area Rediscover the Joy of Making in the interim.

Yours in Making,

Karen Shumway
Secretary, Board of Directors

Find me on Nova Labs Slack: @Karen Shumway
Watch President Sam Aparicio as he addresses the community
Quilting as an Artform
by Tara Travia
In the midst of working towards my PhD, I realized I needed a creative outlet. I wasn’t raised as an artist, in fact, my mom actively discouraged me from anything artistic as it was a distraction from my getting good grades (and not something she was interested in at all). It was all done with the best of intentions as without an academic scholarship, college would have been a pipe-dream; focusing on academics was pretty important.

Acceptance into grad school meant I had “made it.” I had a free ride, so I could begin to explore other interests, you know with all the “free” time I had while pursuing my doctorate. When I wasn’t studying or seeing patients, I spent inordinate amounts of time exploring arts and crafts magazines until I knew that I genuinely needed to make art. It wasn’t a “want,” but a genuine need. I decided quilting was the most practical, colorful, interesting, and accessible option. It was mathematical, tangible, and ended with something I could use. My first trip to a fabric store was overwhelming, exciting, and made my heart sing in a new way. The first time I approached fabric to cut it, I nearly had a panic attack, and then, joy! Painting with math and geometry was a delightful, tactile experience. I quickly grew from slavishly following others people’s patterns to creating art quilts and patterns of my own. I found I had an aptitude for teaching techniques. From there, I learned many other crafts and there is still so much to learn!

I have a great space to do all of these things in my current home, but I really love coming to sew at Nova Labs. There is always someone to provide sage advice on a technique, to help with a project, or to provide loads of reinforcement for whatever you’ve created. There are always loving “ooos and aaahhs” for new creations.

Quilting is a practical skill where you can be as creative as you want. You can simply follow a pattern and use a kit, decide your color scheme with a traditional block, or develop your own improvisational style. At its core, though, quilting uses the most basic of sewing skills: the straight seam. It is simple and fun and before long, you will be sewing curves and making art quilts to be hung on a gallery wall. Or, just make a blanket to sit under on a cold night. Quilting can be as versatile as your interests. Let us know if you are interested in quilting 101 classes or project classes and look for ones coming up on the calendar.

Find me on Nova Labs Slack: @Tara
Technology is a tricky word. For most people, technology means electronics and computers. Really it just means applying scientific knowledge for a practical purpose. Scissors are technology, but most people wouldn’t even consider them when asked to list technological gadgets. Why am I telling you this? You might ask. Well, I am here to tell you a bit about how a team of high school students won a tech-challenge competition. FIRST is something you’ve probably heard off; FIRST Lego League, FIRST Tech Challenge, etc. I will be talking about the latter. FIRST Tech Challenge is a competition in which kids (ages 13-18) are asked to build, program, and manage a robot in an alliance formatted competition.

The Innovotics team is made up of seven extremely intelligent and gifted people; Ben, Brian, Charis, Collin, Ella, Jonah, and Tyler. Over the past couple of years, this team has come together and competed in many robotics competitions. Their journey has been long and frustrating, but they didn’t give up hope. The first competition was in Richmond. Admittedly, it was a struggle, and even though their robot was limited and still learning they made it to the semi-finals. At Charlottesville, they had much better performance than before. Matching with other learning teams, they won the design award.

The Maryland Qualifier was a bit of a rollercoaster, they were worried as it was their last chance to get to the state level competition. During this competition, they learned how to absorb information and use it to improve. They changed the way they worked together and how they interacted with other teams. By communicating with their coaches more often, they succeeded. In this competition, they got recognized by other teams six times, became the runner-up for many awards, and even got the Motivate Award. It was surprising since unpredictably, the judges only accepted three teams instead of five (the number of accepted teams in past competitions). Their great moment of triumph was pulling their opposing team’s robot out of the depot, a bad place to be stuck in since you lose many points. This act showed great sportsmanship and an innovative way of dealing with a problem that didn’t belong to them.
In the next competition (Maryland-DC State Competition), they faced some challenges with disconnecting and their overall performance was on par with others. They were packing up and losing hope when exciting news came. The 1st place team had reconsidered their alliance and asked the Innovotics team to partner up for the next competition. The team chose the Innovotics because they had a faster and more agile robot and they had experienced more matches.

Although this seemed unbelievable, they were so glad they had stayed or they wouldn’t have been chosen. It was a miracle achieved through perseverance. Or as they say, “a very humbling experience.” Again, they were glad for the team-up because, through really good mentors, this caused them to solve their disconnecting problems. They thought they didn’t deserve this amazing chance, but they proved their worth by contributing greatly throughout the competition.

I’m sure by now you are wondering a bit about this amazing team’s robot. Well, it has an intake for taking in blocks, a drive chain, it can move in all directions because of its mechanism wheels. The robot also has lifts and it can push blocks in a variety of ways. An innovative attribute of this robot is its break picker. A claw-like appendage that picks up the block by one stud and holds it in place by means of pressure. Yes, it sounds complicated and enticing to me too. Some of the parts used to build the robot were custom made at NovaLabs using 3D-printers. This robot is unique and works by using all its parts in a synchronized fashion. Innovotics is very grateful for NovaLabs and its plethora of resources and experts it has provided them with. Their first impression of the gadget-filled place was jaw-dropping and indescribable. They were glad it gave them a place to become a winning team.

Although this experience was amazing and different for each and every team member, they all had some great moments in common. Many of the competitions were unexpected and unpredictable. Just the feeling of competing was thrilling.

The perseverance and overall grit that got this team through all the competitions is inspiring. By far, the moment that was most unexpected by this team was getting picked by Cubix (1st place team) in the State Competition. Even though at first they were confused since their name had been said wrong, once the announcer clarified it was all cheers and applause. Tyler said “I was just shocked!” and I think Charis spoke for everyone when she said, “everyone had a moment of blackout.”

This has been a long journey for the Innovotics team. They have developed their abilities and matured greatly. As a team, they have accomplished great things and grown to be better and smarter people. Along the way, they have learned countless things and their interest in STEM has also grown. I am sure none of the team members will ever forget this astonishing experience and I know they will continue to learn and further their knowledge of science, technology, engineering, and math. All I can say is: great job!
PERSONAL PROTECTIVE EQUIPMENT CHALLENGE
by Rick Weil & Daryl Peace

Supplies and equipment needed to safeguard medical staff, diagnose and treat the sick, and help prevent the spread of COVID-19 are in critically short supply. These supplies include hand sanitizers, nasal swabs, face shields, N95 respirator masks, and disposable ventilator valves. Manufacturers across the country are increasing their output to meet this demand.

3M is ramping up production of N95 respirator masks, HP is working with 3D printing partners to expedite production of face shields and masks, and non-traditional suppliers such as the Cotton & Reed Distillery in DC have switched some of their production from rum to hand sanitizer. These manufacturers will not be able to scale up their production processes overnight. Until then, small-scale, low-volume, high-flexibility manufacturers and makers/craftspeople across the country are coming together to help fill this gap.

Designs are being developed and shared across the maker communities, partnerships are being forged with 3D printing firms, donations are being provided for raw materials procurement, production is starting, and distribution of product to medical staff is being coordinated.

Nova Labs is proud of its membership’s mobilization to assist the medical community. Karen Shumway is the Board liaison and face shield contributor. Margie Foster has driven all over the DMV obtaining materials and coordinating the outreach and distribution processes with Peter Von Elling.
There are three Nova Labs teams working on the PPE initiative:

- **Crafter’s Cove (#ppe_fabricfacemask),** under Jalene Gelana’s leadership, is working on sourcing materials and producing Cloth Masks and potentially Cloth Isolation Gowns.

- **One of the 3D Printing teams (#ppe_prusa_faceshield),** under the leadership of Paul Chase, is producing face shields using the Prusa Face Shield design. **Over 550 face shields have been provided to health care workers as of April 1st.**
  
  The first face shields were delivered to a home hospice care facility whose PPE supplies had been stolen and to Loudoun Medical Group’s drive-through COVID-19 testing pop-up. The popup has access to an unlimited number of tests but would have had to stop work if they couldn’t get face shields).

  The Children’s Hospital Radiology department got face shields the next day to replace the very flimsy makeshift shields they were using. George Washington Hospital has requested at least 200 units, and Walter Reed Hospital and University Health in southwest DC have also requested face shields as soon as possible. Even better, George Washington has medical school students that can assemble for us, so this is truly a cooperative effort. Fifty face shields are slated so far for the Fairfax INOVA Emergency Room.

  The DC metro area has asked for a total of 650+ face shields so far, and the numbers just keep going up. Other team members include Karen Shumway, Abby Kohn and Tiffany Winsor (assembly); Thant Aung, Phil Redlinger (transport); Samer Najia, Alec Randazzo, Peter von Elling, Erica Kane, Scott Shumway, Joseph Miller, David Wheeler, Carlos Pilonieta, Eric Offermann, John Link, Daniel Vrolijk, Steve Day, Adam Rhodes, Keith Baldwin, Thanh Nguyen, Rachel Berkhahn, Andrew Albosta, Vinson Cornejo, John Strube, James Redlinger, Todd McAnally, Michael Butterfield and Lee Richardson (3D printing); and last but not least is Eric Offerman of LaserThing.com and Brad Hess & Patrick Waters of Makersmiths (lasercutting).

- **A second 3D Printing team (#ppe-N95) is developing a N95 respirator prototype.** Steve Fritzinger, Paul Chase, and Alec Randazzo are working overtime on one N95 project, which is running parallel to a model developed by Fred Briggs.

Nova Labs is proud of its membership’s mobilization to assist the medical community and forward its own mission by manufacturing PPE. There are already 108 members in the #ppe_challenge Slack channel, and the number of vital contributors is already too numerous to mention. In addition, Nova Labs is providing material support by providing funding for raw material procurement to empower our makers.

We are proud to be one of many makerspaces across the country participating in the PPE effort. If you are a medical institution in need of our assistance, then please send your request to margie.foster@nova-labs.org. Stay safe!

Read more and donate, [click here](#)
To view more pictures, [click here](#)
Luckily, the regional Virginia Science Olympiad tournaments sneaked in ahead of the Coronavirus pandemic, the State Tournament was not so fortunate. Nova Labs had the privilege of contributing by helping a team of highschoolers from the Pinnacle Academy who participated in the Boomilever Event.

A boomilever, in Science Olympian, is a wood structure that is attached to a wall from a single point or area and holds weight. Teams must construct boomilevers that are strong but stay within the weight limit.

Alex, one of the coaches for the team, dropped by Nova Labs one afternoon looking for help. He hit the jackpot when Jennyfer paired him with Dave Fritz, maker extraordinaire, former robotics coach, and a champion of mixing science with kids, regardless of how messy it gets. Dave spent several hours cutting light wood into thin sticks so the team could build and test several prototypes and take their best effort to the regional competition.

Science Olympiad, Odyssey of the Mind, VEX Robotics, and other lesser-known events for youth, afford members of Nova Labs the opportunity to pass on their knowledge and love of science to the next generation of makers. As someone once said, “The best way to predict the future is to make it.”

Find me on Nova Labs Slack: @fabiana
SHOW US WHAT YOU GOT

Be part of Show Us What You Got by posting pictures of what you make on the Slack channel—do not forget to add a caption that includes your full name! A selection of images on the channel will be added to our newsletter each month.
1. Sam Winkelstein
Robot modeled in Autodesk Maya

2. Paul Warner
Finished desk

3. Elvira Woodburn
Monster Truck

4. Paul Chase
Bird feeder

5. Siobhan Williams
Work Table

6. Adam Winsor
Designed and built Telegraphs

7. Dana Yang
Mask

8. Aaron Goldstein
Trivet

9. Yvette Gluck
Japanese Suzuribaku

10. Tara Weaver
Floor Pouf

11. Bill St. Amant
Embroidery

12. Steve Day
Finished up this inlay

13. Patrick Waters
Bed

14. Samer Najia
Star Wars ships

15. Sean Crane
Dragonfly made of steel

16. Fred Briggs
Carbon fiber shell that goes on a personal manned flying drone

17. Richard Weil
Inlaid rim bowl

18. Keith Baldwin
3D printer face shield tops and bottoms
EVENT SPOTLIGHT
by Jennyfer Peterson

Missing your makerspace? Too far away to join in the making? The makerspace may be closed, but you can still continue learning new maker skills. Continue learning from wherever you are. All classes and events are in our virtual classroom. Our classes still feature a live instructor/host, highly interactive learning, and a materials list is provided so you get supplies and learn by following along from the safety of your own home.

Scale Model Basics for Sci-Fi Models: Painting 3D Printed Mech Models - Saturday, April 11, 2020
Online workshop will cover how to paint a 3D printed mech model. We will also briefly discuss dioramas and displays for your figure. A list of supplies is provided for personal purchases so you can make this class hands-on from your home. Turn your simple plastic model into a work of art with this new skill. Register here

Professional Artist Series: Preparing for your Career - Thursday, April 2, 2020
Natalie Abrams, a sculptor and jewelry designer, has exhibited nationally at Pentimenti Gallery, Redux Contemporary Art Center, City Ice Arts, Glass Wheel Studio, Boston Center for the Arts will walk you through the process of applying to exhibitions, galleries, and other opportunities. She’ll go over how to write your bios, biographical narratives, artistic statements, and process statements in such a way that you make the best impression. Register here

AC: Soap Making Workshop - VIRTUAL Thursday, April 9, 2020
The best thing for washing hands in our current environment is soap. Making cold process soap is relatively simple, but endlessly variable. Learn to make cold process soap using silicone molds in fun fall shapes. I’ll be making scented beeswax milk soap with coffee grounds as exfoliant, so if you’ve ever wondered how to incorporate scent, milk, beeswax, or exfoliants into your soap, come Zoom with me in my basement lab. Register here
EVENT SPOTLIGHT
by Jennyfer Peterson

Home Makerspace Tours - Various dates
This is a series where we tour someone’s home workshop or lab. This week our host is Pat Marstall, blacksmithing steward and metalshop lover. Looking to improve and organize your home workshop? Want to get a peek at what tools our favorite makers use? Check out the home workshops of our favorite Nova Labs members. Grab a beer and chips, relax at your computer, and join your fellow makers for a live tour. Turn envy into inspiration for your next project.
Dates: April 6, 2020 or April 19, 2020

PCB Circuit Design & Electronics, From Beginner to Advanced - Tuesday, April 14-15, 2020
Learn the art of PCB design using the open-source PCB CAD software, EasyEDA. Software is very similar to industry stalwart EagleCAD and has similar options, so it’s a good place to start. We’ll be learning basic techniques for optimal PCB layout, schematic design, electronic components and semiconductors, and auto-routing! The project we’ll be making is an Arduino-based OLED Alarm Clock, and we’ll be covering how to order a copy of your project at the end through a PCB fabricator, and how to order the parts from a components distributor such as Digi-Key. Register here

Learn to fold an origami soda can P-51 Mustang airplane - Saturday, April 4, 2020
Bo Wernick will be teaching his “Aluminum Aerogami” class as a virtual hands-on experience. We will be building highly detailed aluminum can P-51 Mustang airplanes from soda cans using the art of origami. They are entirely folded, with no glue, tape, or fasteners. Each participant will get instructions via email, and we will build them together. Each plane measures about 7 inches in wingspan. Register here
Virtual Classroom Instructors:
We need instructors and hosts for online classes, demos, events or meetups. Paid or free events/classes welcome. Don’t know the tech? No problem, we can train you and mentor you.

Contact Jennyfer or Farina to set up a Zoom walkthrough. Reach us on Slack or at events@nova-labs.org. Ask questions, take a leap of faith, a risk, try something different. We are makers, makers learn by doing and taking risks. We can also advise on very low cost equipment to get your home maker lab ready for videos and virtual learning.

PPE Help, If you have a 3D printer or are willing to do some sewing. We need your help with a growing build of face shields and other protective equipment. We could use some more folks taking on program manager and leadership roles so we stay focused and successful. We have four channels.

#ppe_challenge is a general free-form idea incubation and general postings forum.

#ppe_prusa_faceshield is specifically targeted to the Nova Labs build of the Prusa face shield.

#ppe_n95 is specifically targeted at the Nova Labs build of an N95 solution.

#ppe_fabricfacemask dedicated to designing, sewing, and delivering fabric face masks.
HAPPENINGS IN APRIL

Some of the Main Attractions in April are below. Class names are clickable.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/2/20</td>
<td>19:00</td>
<td>AC: Professional Artist Series: Preparing for your Career - VIRTUAL</td>
</tr>
<tr>
<td>4/4/20</td>
<td>13:00</td>
<td>AC: Learn to fold an origami soda can P-51 Mustang airplane - Virtual</td>
</tr>
<tr>
<td>4/6/20</td>
<td>18:00</td>
<td>BL: Home Makerspace Tour - Pat M</td>
</tr>
<tr>
<td>4/7/20</td>
<td>19:00</td>
<td>Virtual Nova Labs Community Meetup - News,demos,flash talks,remote access</td>
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<tr>
<td>4/7/20</td>
<td>19:00</td>
<td>CiviCRM Meeting VIRTUAL</td>
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<tr>
<td>4/8/20</td>
<td>19:00</td>
<td>EL: Introduction to Basic Electronic Circuits - VIRTUAL</td>
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<tr>
<td>4/8/20</td>
<td>19:00</td>
<td>Build a humanitarian drone with Team RhinoHawk VIRTUAL</td>
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<tr>
<td>4/9/20</td>
<td>18:00</td>
<td>AC: Soap Making Workshop - VIRTUAL</td>
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<tr>
<td>4/10/20</td>
<td>19:00</td>
<td>Kinetic Sculpture Build Team - VIRTUAL</td>
</tr>
<tr>
<td>4/11/20</td>
<td>14:00</td>
<td>Scale Model Basics for Sci-Fi Models: Painting 3D Printed Mech Models</td>
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<tr>
<td>4/13/20</td>
<td>19:30</td>
<td>Team Leads Monthly Meeting VIRTUAL</td>
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<tr>
<td>4/14/20</td>
<td>18:00</td>
<td>EL: PCB Electronics Circuit Design 101 (Day 1 of 2) - Virtual Classroom</td>
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<tr>
<td>4/14/20</td>
<td>19:00</td>
<td>CiviCRM Meeting VIRTUAL</td>
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<tr>
<td>4/15/20</td>
<td>18:00</td>
<td>EL: PCB Electronics Circuit Design 101 (Day 2 of 2) - Virtual Classroom</td>
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<tr>
<td>4/18/20</td>
<td>13:00</td>
<td>NVIDIA Jetson GPU Meetup</td>
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<tr>
<td>4/19/20</td>
<td>17:00</td>
<td>EL: Home Makerspace Tour - Samer N</td>
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<td>4/21/20</td>
<td>19:00</td>
<td>CiviCRM Meeting VIRTUAL</td>
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<tr>
<td>4/22/20</td>
<td>19:00</td>
<td>EL: Intro to Sensors with Arduino using TinkerCAD - VIRTUAL</td>
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<tr>
<td>4/28/20</td>
<td>19:00</td>
<td>CiviCRM Meeting VIRTUAL</td>
</tr>
</tbody>
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Calendar of Events
Provided by Instructors and Randall Wood

COMMUNITY MEETUP

Nova Labs Community Meetup
News, demos, flash talks, remote access
Tuesday, April 7, 2020 • 7:00 pm.
Click here
POLICY MINDER

Remember that Nova Labs is closed to both members and non-members for the duration of the COVID-19 crisis. Be assured that we will be sure to announce our re-opening through every channel we have!

SAFETY REMINDER

We may have closed to encourage social distancing during the COVID-19 pandemic, but we still want you to be safe Makers! Follow all the same safety protocols in your home we require in the labs. And wash your hands for 20 seconds with soap and water frequently. We want to see everyone back with 10 fingers, full sight, and infection free!

HELPING SMALL BUSINESSES

Bryan Hammock, an associate and hopefully soon to be key member, has created a company to help support artists affected by the COVID-19 crisis. The company, Infectious T, allows artists to express messages of safety, hope and sometimes levity concerning the crisis, via artistic t-shirts that are sold at infectiousshirts.com and Instagram.com/infectiousshirts.

Bryan hopes you’ll remember and consider supporting all your local creatives hard hit by this economic downturn, several of whom rely on Nova Labs’ equipment and training to bring their visions to life. And, of course, they all hope everyone stays safe.
WELCOME KEY MEMBERS

Name: Jordan Woodswahl  
Sponsor: Bradley Matthews  
Biography: Jordan grew up around cabinetmaking and construction as a kid. His work is in the live entertainment and exhibit field (carpentry-metalworking-graphics etc) so he spend a lot of time planning and managing the work that other’s do. His biggest joy in making is that he’s doing it with my own hands. Jordan started out in the woodshop but hopes to branch out to welding, stained glass and CNC embroidery!

Name: Aaron Enatsky  
Sponsor: Shane Smith  
Biography: Aaron grew up tinkering in his dad’s basement shop. He recalled the excitement when his uncle first told him about an electronics kit company called Heathkit (too bad he missed it by a few years). He still gets that Heathkit excitement when working on Microbit and Pi projects with his kids. I’m certain the desire to tinker led him to pursue an engineering degree and then law degree with a focus on technology. Between running a small law firm and family duties, he likes to build (or at least daydream about building). He has milled a backyard cherry tree with NOVA labs equipment for various projects and built pull out shelves for a home pantry. He built a belt mounted poker chip dispenser with the help of NOVA labs’ 3D printers and the NOVA Labs community members. He also likes to tinker with coding (e.g., building projects with Python). Since he joined NOVA Labs, he has volunteered hours for the greenway build out, pop-up planning, wood shop round-up/s, green orientation; conducted classes on intellectual property and let NOVA Labs keep all of the class fees; participated in an E2M event, and volunteered for NOVA Labs’ Maker Faire booth.

Name: Steve Finch  
Sponsor: Debbie Finch  
Biography: Steve works with computers all day and enjoys wood working in his spare time. He is enjoying learning about and using the laser cutters.

Name: Rick Weil  
Sponsor: Frank Sogandares  
Biography: Rick spent considerable time last year developing and teaching a bowl-turning class, a sharpening class, holding lathe-specific office hours, and using the Metal Shop to prototype some lathe fixtures that help safely make hollow vessels. Rick has a breadth of “regular” woodworking skills but is a very skilled turner with a nuanced eye for form and detail and a great understanding and articulation of technique.
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