



EAA Chapter 691 Newsletter
December 2022

America Young and Barbara Fox, our vetted Young Eagle co-coordinators and volunteers

On the Web @ www.eaa691.org

EAA 691 is:

President: Will Fox

Vice President: John George

Secretary: Pierre Levy

Treasurer: David Young

Web Editor: Marilyn Phillips

Newsletter Editor: April Fox

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Upcoming Events

→ **Meetings Schedule (unless otherwise noted)** ←

9:30am - social time

10:00am - business meeting

**10:30am -
speaker/workshop/training**

January 21st, 2023:

The Spaceflight Experience – Mike Mullane KSAF Jet Center Hangar

February 18th, 2023:

Chapter Flyout to Grants (KGNT), 9:00- 11:00AM.

February 25th, 2023:

Young Eagles Workshop - KLAM Terminal Building, 9:00AM-3:00PM.

March 18th, 2023:

Chapter Fly-out to Navajo Lake -Navajo Lake Airport (1V0) - 9:00-11:00 AM.

April 15th, 2023:

Building Skills Training – Composites- Los Alamos Hangar - 10:00-12:00 AM

May 20th, 2023:

Back Country Flying – Ron Keller KSAF Jet Center Hangar, 10:00AM-12:00 AM.

The Spaceflight Experience

January 21st,
Santa Fe Jet
Center Hangar

Retired Astronaut Mike Mullane will give a talk about his experiences riding space rockets. He will have books for purchase at the event- all are welcome!



Letter from the editor

by April Fox



We had a great turn out for the Christmas party, thanks again to David and America Young for opening their beautiful house up for the Chapter. There's a lot of exciting events planned for 2023, and we have some new members to onboard in our shenanigans.

Marilyn Phillips has been working hard alongside Skip to get our website up and running- an integral step in becoming a 501(c)(3) non-profit organization. Thanks to all who are working hard to make this happen.

Please don't hesitate to send me articles, photos of you flying, or your build projects- I'm always looking for newsletter content. Thanks!

President's 2022 Report

by Will Fox



2023 Is Going To Be A Very Interesting Year.

"The best way to predict the future is to create it." – Peter Drucker

We have a lot of interesting activities planned for the Chapter this year. This coming Saturday, January 21st at the Santa Fe Jet Center hangar, Mike Mullane will be talking to us about what it was like to be a Space Shuttle astronaut. The social starts at 9:30am and the meeting starts at 10:00am. You won't want to miss this one.

We are also planning more fly-outs and Young Eagles activities for this year. Speaking of Young Eagles activities, we are planning a Young Eagles Workshop in February that will be a whole day STEM activity where kids can learn about aviation and building airplanes. We are looking for members that would like to help teach and participate in the Workshop, so let me know if you are interested. We are also going to have a couple of building skills classes this year. One will be on composite construction and the other on aluminum aircraft construction. We plan to post the schedule for these activities on our website. Speaking of our website, we have a new one that we are in the process of building that will have a lot more information about the Chapter and our programs and activities. We hope to have it up and running in the next month or so.

Winter and the cold weather put a bit of a dampener on our weekly work sessions on the Dragonfly project, but that will change as Spring approaches. However, in the meantime, we have been working on the design of the propulsion system and developing a cost estimate for a couple of alternatives. High power, permanent magnet electric motors and energy dense lithium batteries are not inexpensive, so we need to get a good idea of what it is going to cost, so we can put together a plan to raise the necessary funds to support the project. The exciting news is that we can expect a real increase in the performance of the Dragonfly with an electric propulsion system 😊



One of our fly-outs will be to Navajo Lake airport in northwestern New Mexico. It is a hidden treasure on top of a mesa with a view of the lake. Looks like the perfect place for a bring-your-own-brunch-and-lawn-chair gathering that we are planning for few months from now. (Photo courtesy of Jeff Archuleta).



Member Happenings

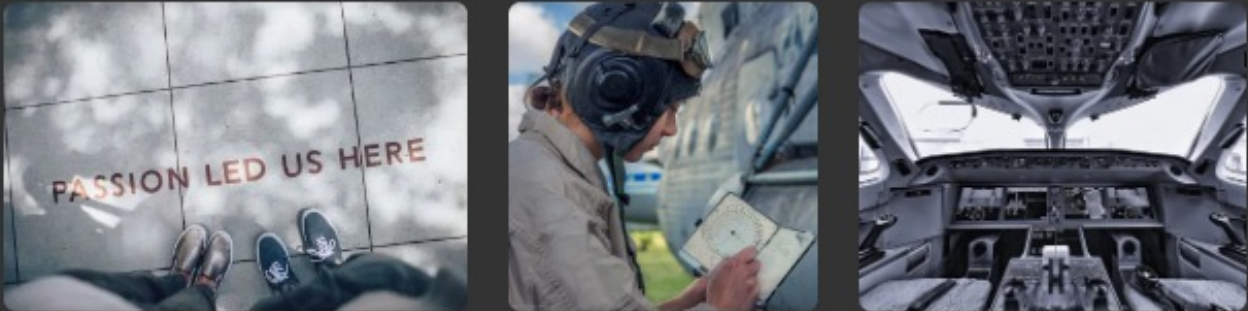
A few members are headed for the Copperstate Fly-in March 24-26 in Mesa AZ.

They are staying at the

La Quinta Inn & Suites by Wyndham Mesa Superstition Springs

6530 E Superstition Springs Blvd.
Mesa, AZ 85206

Copperstate Fly-In
March 24-26, 2023
Falcon Field Airport
Mesa, Arizona



Tech Corner

by Will Fox



Sustainable Aviation

Recently, my sister, who lives in Wyoming, home of the -70 degree wind chill factor, gave me a shellacking regarding my ignorance about biofuels. In one of our normal telephone calls where we talk about family, politics, and how to solve the world's problems, she happened to mention that biofuels looked promising for commercial aviation, and asked what did I think about that. I said carbon is carbon, and it didn't much matter if it came from plants and vegetables or dead dinosaurs; it makes CO₂ when it burns. Then she laughed that little laugh that she uses when I say something dumb and explained to me that adding a renewable biofuel to jet fuel could significantly reduce net carbon emissions. She explained that with biofuels you basically recycle the CO₂ instead of pulling more of it out of the ground. I hadn't really thought about that, but I argued it couldn't be very efficient. Then she told me that efficiencies up to 80% were possible. I was starting to feel like a one armed man in a fist fight. So I decided to do a little research on my own, and sure enough you can mix regular jet fuel with biofuel and the engines will keep running. In fact some airlines are already doing it on commercial flights and plan to do a lot more of it in the future to reduce their carbon emissions.

It is estimated that commercial aviation emissions currently contribute a 4% increase in the amount of solar energy absorbed by the Earth. This is because burning jet fuel produces CO₂ and other emissions that help to trap energy from the sun and prevent it from escaping into space. This effect contributes to global warming. As a result, a number of airlines are committed to reducing their emissions by using a relatively new form of jet fuel called Sustainable Aviation Fuel (SAF). SAF is made by mixing regular jet fuel with biofuel. SAF is called a "drop-in" fuel because it is totally compatible with existing jet fuels and does not require any special handling or treatment. The International Air Transport Association ([IATA](#)) reported that in 2016, 500 flights were conducted using SAF. That increased to 450,000 flights in 2022 and is expected to increase to 2,000,000 flights in 2025. Chances are that if you haven't been on a flight using SAF, you will be in the not too distant future. The airlines are also writing long term contracts to purchase SAF. In 2022 there were \$17B in contracts for SAF, and by 2025 they expect that number will be \$30B.



The amount of Sustainable Aviation Fuel (SAF) has tripled in 2022 compared with last year.

There are some big names involved in SAF like Airbus, Boeing, Rolls Royce, United Airlines, Delta Airlines, Avfuel, Neste, and British Petroleum to name a few. However, the current use of SAF is still small potatoes compared to the use of regular jet fuel and represents only 0.1% of the current commercial aviation demand. But its production and use is growing exponentially, because the airlines see it as an immediate step that they can take to reduce their carbon footprint. The IATA thinks that SAF can lead to reductions in CO2 emissions of up to 80% in the future.



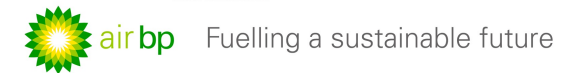
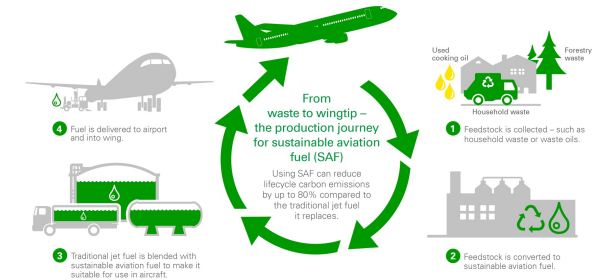
But the stuff isn't cheap, at least not right now. In 2020 the price of SAF was over double that of regular jet fuel. Proponents of SAF claim that scaling production up and continued research and development will reduce the price of SAF. The cost of biofuels used in SAF can be reduced by using feedstock from waste streams that come from the food industry, agriculture, forestry, and even algae, and conversion efficiencies can be as high as 90%. The airlines are also being incentivized to use SAF to meet their carbon reduction goals. Meanwhile the cost of regular jet fuel continues to rise at 1% per year according to CFM International, a major engine manufacturer.

I wanted to get a better handle on cost and the practicality of using SAF to replace regular jet fuel, so I got ahold of my brother-in-law, who is a pretty smart guy. Not only does he run a refinery for an oil company, but he also had his own little biofuel processing plant in the back yard. Through some chemical engineering magic he turned McDonalds french fry grease into something that his diesel truck engine would happily run on. So I figure he knows a thing or two about both petroleum and bio fuels. He told me that petroleum and bio fuel costs are both driven by supply and demand. If the airlines start buying a lot of biofuel, its price is more likely to go up than down until they find a cheaper way to make it, and the companies that produce it can ramp up production. He also said that the biodiesel fuel he was making had a higher freezing temperature than regular diesel fuel, so he had to mix the two together to keep it from freezing in the winter. It has something to do with long carbon chain molecules in biofuels versus shorter ones in petroleum fuels. That is one of the reasons why they use a blend of biofuel to regular fuel in SAF. SAFs are currently approved for blends from 10% to 50%.

By the time I got off the phone with my brother-in-law it was clear to me that the development and use of SAF to replace jet fuel wasn't going to be all unicorns and pixie dust. On the other hand, it has the potential to become cost effective in the future, and it can certainly begin to reduce the commercial aviation's carbon footprint right now. That is a start at least.

I should call my sister and brother-in-law more often. I could learn a lot from them:-)

How is sustainable aviation fuel made?



Biofuels like Sustainable Aviation Fuel (SAF) can be made from things such as used cooking oil, forestry waste, and even algae. It is currently blended with traditional jet fuel for use in aircraft. SAF can reduce carbon emissions by up to 80% compared to the fuel it replaces.

EAA Chapter 691 Membership Application/Renewal Form



Please mail this form along with \$25 to our Chapter Treasurer, Checks can be made out to EAA Chapter 691:

David Young
819 Gonzales Rd
Santa Fe, NM 87501

Name: _____

Spouse/partner's Name: _____

EAA #: _____ Expiration Date (MM/YY) ____ / ____

Address: _____ City: _____ State: _____ ZIP: _____

E-mail: _____

Home phone: _____

Work phone: _____

Cell phone: _____

Please list your currently flying A/C and any finished or in-progress projects: