



# Solar Airplane 2020-2021

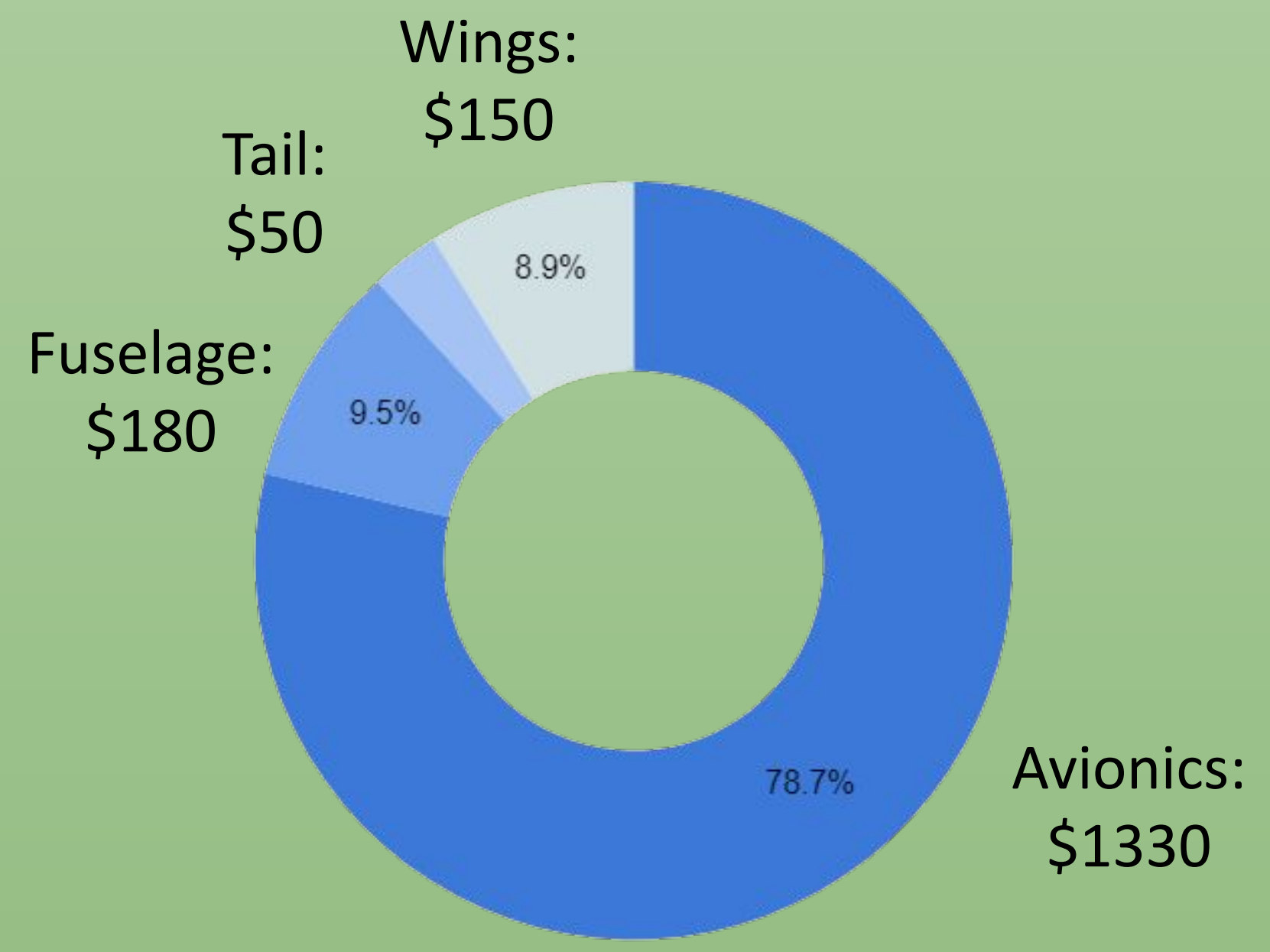
## Background

Solar Airplane aims to create a UAV that utilizes solar cells to extend flight time. A modular payload bay will be incorporated so the aircraft may be used in multiple different use-cases, such as search-and-rescue, payload drop delivery, and surveillance of a large area.

## Goals & Objectives

- To provide students an understanding of integrated systems, airplane design, prototyping and manufacturing
- Aim to increase the flight time of our UAV by integrating solar panels and minimizing mechanical losses
- This quarter's objectives were to research the components of a UAV, create a design utilizing Solidworks, run stress analysis on components, and create models on electrical components

## Budget 2020-2021



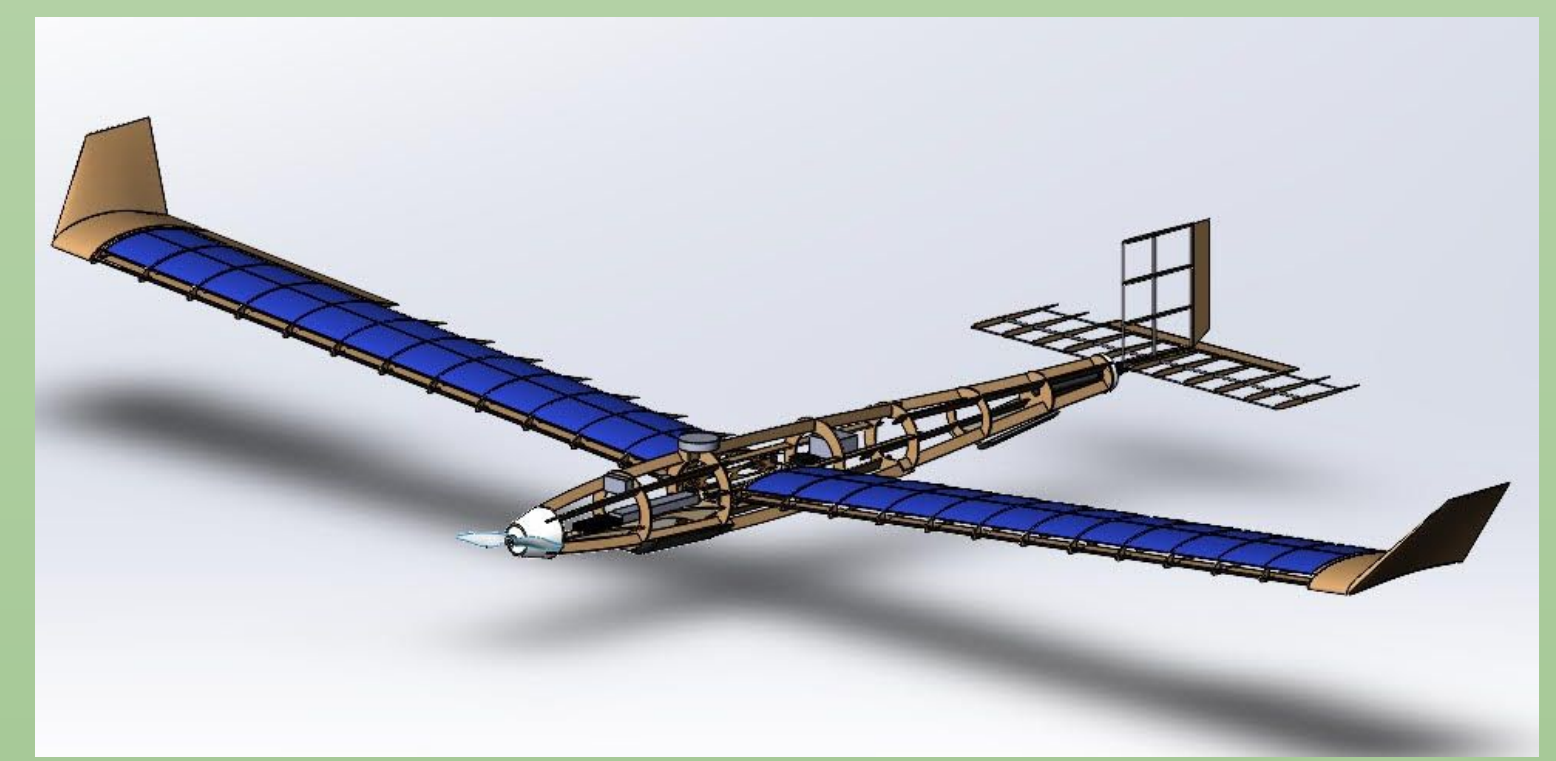
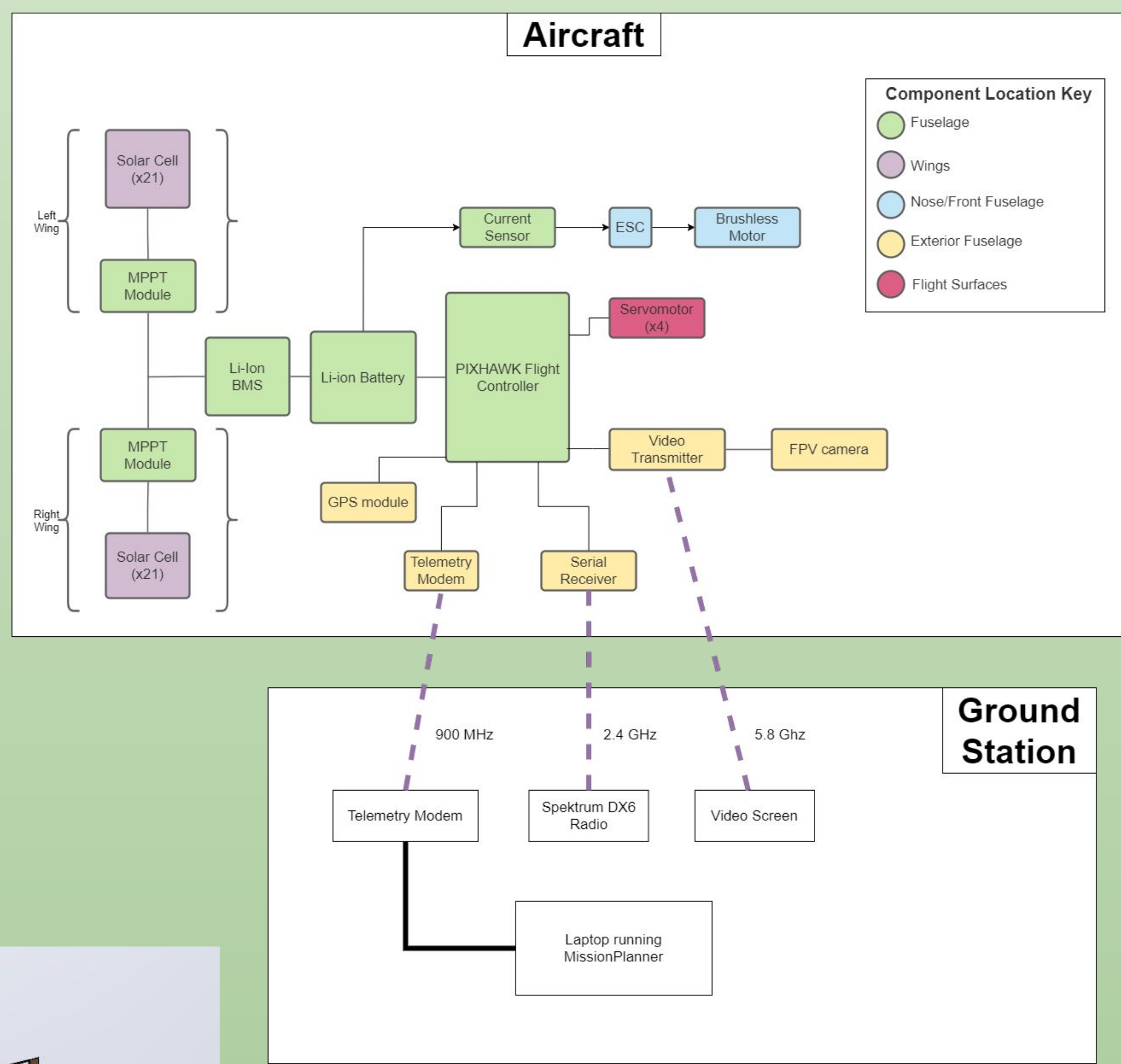
## Current Status

- 50% of components shipped
- revision of characterization of aircraft using Excel
- Components selected

### Aircraft Specifications

Current Weight	6.3 lbs.
Payload Capacity	0.5 lbs.
Wingspan	10 ft 5 in
Wing Loading	9.7 oz/ft <sup>2</sup>
Stall Speed	12.3 mph
Total Length	6 ft.
Power Consumption	50 watts
Power Generation	117 watts
Solar Cells:	Sunpower C60

## Wiring Diagram



## Requirements

- Multipurpose aircraft
- Must be able to fly in 20 mph winds
- Solar cells supplement battery power
- Minimum of 30 minutes extension beyond the battery-alone duration
- GPS and camera integration
- Aircraft should be portable and fit within a small car (max. component length 6ft)
- In-flight data received via remote terminal

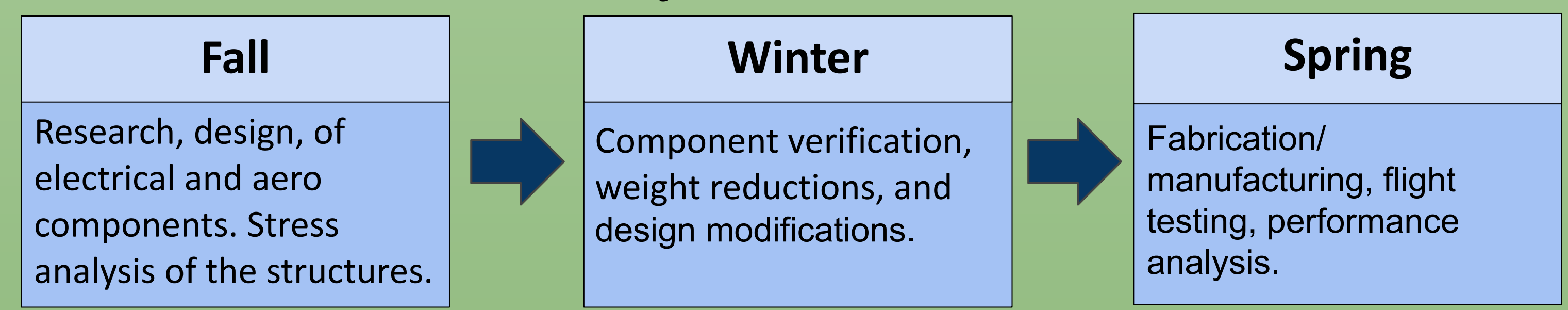
## Next Steps

- Continue with characterization of MPPT, battery charging cycles, & development of most efficient flight plan
- Begin fabrication of wings, fuselage, and tail parts. Concurrently build jig for assembly of all parts.

## Team Members

Project Manager: Andre Necochea			
Avionics Lead: Preston Sterling	Fuselage Lead: Alexander Tobey	Tail Lead: Gabriel Nicklaus	Wings Lead: Tyler Ong
Ariel Rivera	Bhumi Tandel	Danny Tran	Jeremy Pate
Chi Hsuan Miao	Dylan Luu	Darshan Donawala	Mathias Kasendar
Dhruv Khanna	Joseph Wood	Jainam Hitesh Vasa	Omid Souri
Elise Jones	Keely Hsieh	Malcolm Overbaugh	Shaw Chiau
Ethan Leong	Hansel Yani	Sary Aranki	Thaddeus Yan
Ezequiel Amador-Ocroya	Nicolas Handoko		
Freddy Gomez	Noah Prochnow		
Hafshah Arin	Octavio Altamirano		
	Patrick Turpin		
	Joseph Traficanty		
	Uran Berisha		

## Projected Timeline



For further inquiry, contact:

<b>Project Manager:</b>	Andre Necochea	anecoche@uci.edu
<b>Wing Lead:</b>	Tyler Ong	ongtd@uci.edu
<b>Fuselage Lead:</b>	Alexander Tobey	atobey@uci.edu
<b>Tail Lead:</b>	Gabriel Nicklaus	gnicklau@uci.edu
<b>Avionics Lead:</b>	Preston Sterling	pbsterli@uci.edu