**Team Name: 1082 Squadron (Air Cadets)**

**Our Experiment: Advanced In-Flight Image Stitching**

1. Our main objectives/milestones within our experiment are:
   1. Achieving having taken images using our code from the ISS (Zarya module) using the Pi Camera.
   2. Achieving a panorama image having been made using our image stitching algorithm while our program is running.
   3. Actively achieving the creation of a 3D image using 3rd party application/software such as modeling software after we have received our data back from its runtime on the ISS.
   4. Achieving the creation of a 3D Movie using a combination of both our 3D image and the metadata from individual images.
2. We are expecting our program to correctly take images using the Camera fitted onto the AstroPI model. We are expecting our algorithms to correctly detect if one of our images is too dark/too flared and delete it. If it is ok then we will cut out the “portal” of each of our images using one of our algorithms to remove/replace the black area with alpha/transparency. We will also stitch all of our images together using a different algorithm which will create our panorama image.
3. We expect as our results :-
   1. Two or three panoramas of the daytime of the Earth – we will start a new panorama if night is detected
   2. To save key frame images approximately every 5 minutes to ensure that if the above stitching algorithm doesn’t work in flight, we have enough data to fix the algorithm on Earth
4. After the flight we will use the data to:-
   1. Generate 3D stereo images and calculate hight of features on the ground below
   2. Generate a 3D movie that has pictures from all around the world.
   3. Calculate a weather front’s relative size and to give the latiude.
   4. Compare the latitude of vegetation growth ( winter vs summer) to see if there is a corrolation and change depending to the season.
5. We estimate that our experiment will use a maximum of 2940MB in-flight