Comp 465 Fall 2017 Warbird Simulation P3 **Due 12 / 10 / 2017**

In the third phase you add texture to the simulation, write your own vertex and fragment shaders, and complete any aspects of phase 1 or 2 that are incomplete or could be improved. The final phase completes, or refines, work from phase1 and phase2 and provides a more interesting visual presentation.

A "star field" will be used to display textures of space scenes (stars, nebulas, etc.) on 6 planes that enclose your target practice system. You can use the same star texture for all surfaces or not – your choice. Different textures provide visual clues as to where you are and what you are looking at. You do not need to use OpenGL's "sky-box", the simplest solution is to have 1 plane with 1 texture and draw it in 6 placements. You could have up to 6 individual planes that have different textures on them, and forming a box enclosing your Ruber system. You can use IrfanView to convert images to raw format (free and available in the lab – be sure to also install its plugins for conversion to raw format).

Your vertex shader should support two lights in your fragment shader. There should be a point light at the origin that is the light from Ruber. This point light does not need to have attenuation. If you want to have attenuation you can so long as the light effect is visible on all the moons of Duo. There should be a "head lamp". The head lamp is directional, same direction as the current camera looking down –Z. For extra credit also make a spot light and attach it to the ship's follow camera. If the spot light has attenuation, you should be able to see its effect on the ship and on other objects in view and range. Set the cone so the front part of the ship is illuminated. There should be a small ambient light effect so that every surface is visible. You could have the option of turning each light on or off from a keyboard press {'a', 'p', 'h' should toggle the ambient, point, and head lamp lights on or off}. Of course if you have a spot light you should also have a 'l' option for spot light.

You should submit your source code and documentation on Moodle. You should submit "electronic/soft" documentation (readme) as files included in your zip archive. You do not need to repeat information in the project specification and spreadsheets. Documentation should clearly state all members of the group, their emails. It should also state the OS and any developmental API information that is needed to build and or run (VS 2015 or VS 2017, CMake, GLFW, …) Documentation should provide "meta information" – what you would like to read if you were looking at this project source code after not using (reading, editing) it for 1 year. What you would like to remind yourself about your design and implementation. Meta information includes diagrams, tables, and text narrative. You should also briefly describe how (the tools, or major algorithms) you used to make your models, as well as any information I may need to run/grade your project. If you did something neat – you should write to tell me about it so that I can be sure to see it.

As before, ask questions if you have them. Lab is the most efficient way to discuss the project.