JSC Senior Design Project and or Intern Request Form

EA3-5

Project Title:	Cooled Enclosure for Scientific Imager
Project Description:	Development and test of enclosure to house and cool imager for scientific imaging.
Choose most appropriate area of research:	☒ Planetary Surface Systems ☐ Ground Operations ☐ Propulsion ☒ Spacecraft ☐ Human Health Program
Program Applicability	☐ ISS ☐ CEV/SLS ☐ Commercial Crew ☐ Asteroid ☒ Adv. Technology (AES/STMD)
Choose one project:	**Roles and Responsibilities of Senior Design POC/Mentor**
☒Senior Design	I have coordinated with my management and I am able to support at least three (3) teleconferences (kick-off, mid-term, and final) with a Senior Design Project Team at a university that chooses my project. I understand that I shall not provide any sensitive or classified information to the Senior Design Project students of faculty. I will provide feedback to the project team if requested.
☐Internship	I have coordinated with my management and I am able to support an intern. If an intern is selected for my project, I will provide an environment where an intern can grow and we may have a mutually beneficial and successful internship. My project will be able to provide a desk space, work area, and computer for an intern. I will review any final report or presentation that the intern generates during his/her internship and submit it to Export Control (DAA) for approval. This project opportunity will be posted in OSSI, through the office of Education (use exact same title). OSSI website: : https://intern.nasa.gov
Check desired Timeframe for Internship:	☒ Year long ☐ Summer ☒ Fall ☒ Spring
Check desired Major/Minor(s) for Internship:	☐Aerospace Engineering ☐ Aeronautical Engineering ☐ Astronautical Engineering ☐ Biomedical Engineering ☐ Chemical Engineering ☐ Civil Environmental ☐ Health Engineering ☐ Electrical, Electronic Engineering ☐ Computer Engineering ☒ Engineering Physics ☐ Industrial Manufacturing Engineering ☐ Materials, Metallurgical Engineering ☒ Mechanical Engineering, Mechanics ☐ Nuclear Engineering ☐ Astronomy, Astrophysics ☐ Chemistry ☐ Optics ☒ Physics ☐ Atmospheric Sciences ☐ Geography ☐ Geosciences ☐ Oceanography ☐ Natural Resource Management ☐ Mathematics, Applied Mathematics ☐ Computer Science ☐ Astrobiology ☐ Biology ☐ Biochemistry/Biophysics ☐ Microbiology Bacteriology ☐ Chemical Engineering ☐Other, please specify:

Mentor Name:	Doug Holland	Mentor's E-mail:	s.d.holland@nasa.gov
Title & Organization:	EE / EA351	Phone #:	X33638
Alternate POC/Mentor Name:		Alternate's E-mail:	
Education Office Signature and Date:		Intern Mentor's Signature & Date:	
As supervisor/manager, I approve of the above named individual as Senior Design Project POC of Intern Mentor.		Supervisor/Manager's Signature & Date B W S BRUCE W. SAUSER	5-31-13
(For Intern Request Only) As Administrative Officer, I am aware that the above named Intern Mentor has submitted a request for an Intern.		Administrative Officer's Signature & Date:	

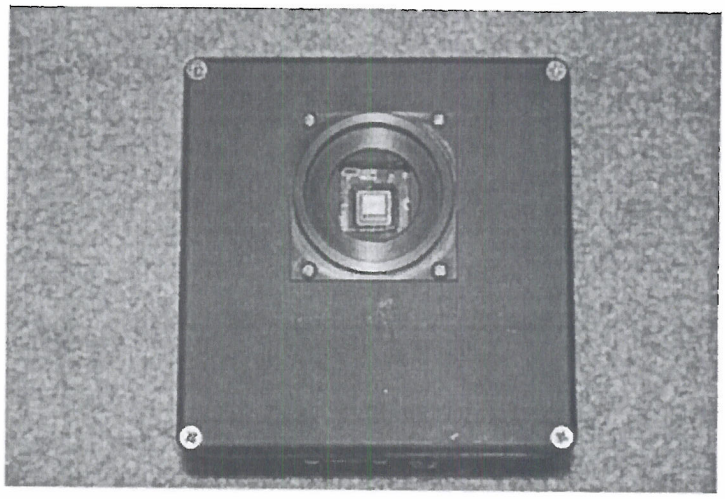
TEXAS SPACE GRANT CONSORTIUM
DESIGN CHALLENGE

TOPIC # - TDC-15-F12

COOLED ENCLOSURE FOR SCIENTIFIC IMAGER

Project Description:
The objective of this project is to design, build and test an enclosure for a visible to near infrared imaging sensor. The enclosure needs to be air-tight, maintain internal dry air, provide cooling for the sensor, and provide a warmed optical window. These requirements are needed for long duration, low noise imaging as is required for medical, physical science, and astronomical imaging. Successful completion of this project includes the design and analysis as well the build and testing of the enclosure.

Image Sensor in Thermal Electric Cooled Enclosure



In this project you will:

- Research: cooling options, gases to fill the enclosure, optical windows, air tight connectors, methods to transfer cooling to sensor and heat to optical window, desiccants, gaskets, and cold fingers / cold traps.
- Design and analyze the enclosure: Produce a design that accommodates supplied circuit boards and perform thermal analysis on the enclosure.
- Build and test: Build the enclosure and produce test results indicating the level of thermal noise that is removed with the developed system.

Design Team Profile:

- Level: Upper Division students
- Major: Mechanical Engr, Physics
- Teams: Mentor may accept more than one team

Design project topic offered by:
NASA Johnson Space Center
Advanced Development Office