

GLENN RESEARCH CENTER – NASA Space Academy
NASA “SOLAR” OPPORTUNITY – 2016

Mentor Name/Phone #: Dr. Geoffrey A. Landis/ 216-433-2238

Office/Division Name: LEX/Power Division

Branch Name: Photovoltaics and Electrochemical systems

Project Title: Engineering Design Study of Future Missions

Type of Opportunity: NASA Space Academy at Glenn - 2016

Project Description:

1. Brief background & NASA mission/program support:

Venus, the planet closest to Earth in size and composition, is a planet that is much less explored than its smaller neighbor Mars. Due to the surface pressure and atmospheric pressure, this is a difficult planet to explore, and yet it is a planet of great scientific interest. This project will analyze the engineering design of a mission to Venus.

2. Objective of project:

To execute engineering design of a future mission to Venus

3. Specific 3-student Team assignment:

The project is aimed at a systems analysis of the feasibility of a future mission to Venus. The students will-

- a) Establish Team- Students and mentors will meet to establish a plan, identify roles, and responsibilities.
- b) Research design techniques- gather information on science mission requirements, research past design approaches, learn relevant information about the Venus environment, and gather further background information as needed.
- c) Evaluate top level design concept to meet science requirements.
- d) Divide design into relevant engineering areas, and complete a design study to determine whether design is feasible to accomplish the mission. If design is not deemed feasible, the requirements of the mission will be reevaluated and other designs will be investigated.
- e) Report-Oral presentation and publication (NASA TM or conference paper or journal article, depending on results) summarizing the results and recommendations.

4. Expected outcomes – include comments on -

- (a) **Research:** The team of three students will be mentored by a group of mentors to execute an engineering feasibility assessment of a Venus mission concept, including engineering trade studies of various alternate concepts. The research outcome of the project will consist of the concept development.
- (b) **Presentations:** The team will present their results to Glenn senior management, and participate in a NASA Glenn Center-wide poster presentation during the final week of the Academy.
- (c) The project will culminate in a final report detailing the design, including the alternate design choices considered.

Desired Attributes:

* Computer and/or Special Skills: familiarity with engineering software such as Matlab and Solidworks would be useful, but is not a requirement

* College/Academic Level at time of Internship or Fellowship:

X Senior or Rising Senior X Master's X Doctoral

* Academic Disciplines/Majors: Physics, engineering, computer

Applicable Higher Ed. Program:

NASA (Space) Academy

Session(s) (select): X Summer 2016

Alternate Mentor(s) or Co-Mentor(s) Name(s):

Phone(s): Code(s):

Dr. Aloysius F. Hepp, (GRC-LEX0)/ (216) 433-3835

ACRONYMS:

SOLAR – Student On-Line Application for Recruiting Interns, Fellows and Scholars