



JARVIS CAFFREY

Oregon State University, College of Engineering, Nuclear Engineering & Radiation Health Physics

Degree:

B.S. Radiation Health Physics, Oregon State University

Advisor:

David M. Hamby, Ph.D.

Scholar Donors:

ARCS Foundation Portland Chapter

About the Scholar:

The risks associated with the natural space radiation environment are a limiting factor for exploration missions outside of Earth's protective magnetic field. These radiation environments require specialized detectors to measure the amount of harm to human explorers and to electronic equipment. Jarvis has studied the impact of radiation upon astronauts and developed a prototype detector to assess the harm caused by the unique radiation environment in space. Presently, he is working with NASA's nuclear propulsion team in developing the high-efficiency rocket engines that are needed for upcoming Mars exploration missions. As a Pathways Student Trainee at Marshall Space Flight Center, Jarvis will be working as a NASA employee between school terms while he completes his doctorate in Nuclear Engineering.

Benefits to Society:

The risks associated with the natural space radiation environment are a limiting factor for exploration missions outside of Earth's protective magnetic field. These radiation environments require specialized detectors to measure the amount of harm to human explorers and to electronic equipment. Jarvis has studied the impact of radiation upon astronauts and developed a prototype detector to assess the harm caused by the unique radiation environment in space. Presently, he is working with NASA's nuclear propulsion team in developing the high-efficiency rocket engines that are needed for upcoming Mars exploration missions. As a Pathways Student Trainee at Marshall Space Flight Center, Jarvis will be working as a NASA employee between school terms while he completes his doctorate in Nuclear Engineering.

Awards and Honors:

NRC Licensed Research Reactor Operator: 2012 - Present
First Place in Science Category - "Particle Tracking Improvements for Cosmic Ray Microdosimeters" - NASA Marshall Space Flight Center Intern Expo - Summer 2013
Session Award for Best Presentation: "Detection of Radiocesium in Japanese Coastal Waters" - ANS Student Conference - 2012

Publications and Posters:

Caffrey, J.A., Hamby, D.M. *A review of instruments and methods for dosimetry in space*. *Advances in Space Research* 47 (2011) 563-574.
Caffrey, J.A., Hamby, D.M. *"Space Dosimetry" Measurements, Instrumentation & Sensors*. CRC Press. Accepted Aug. 30, 2012. Invited chapter contribution.
Caffrey, J.A., Hamby, D.M. *Space Radiation Dosimetry: Overview and Recent Developments*. *Recent Patents on Space Technology* 3 (2013) 3-12. Invited review.

Caffrey, J.A., Higley, K.A., Farsoni, A.T., Smith, S., Menn, S. *Development and deployment of an underway radioactive cesium monitor off the Japanese coast near Fukushima Dai'ichi*. Journal of Environmental Radioactivity 111 (2012) 120-125.

Hamby, D.M., Lodwick, C.J., Palmer, T.S., Reese, S.R., Higley, K.A., **Caffrey, J.A.**, Sherbini, S., Saba, M., Bush-Goddard, S.P. *The new Varskin 4 photon skin dosimetry model*. Radiation Protection Dosimetry 154-3 (2013) 356-363.