THE UNIVERSITY OF ARIZONA
College of Engineering

Aerospace and Mechanical Engineering Seminar

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Practical Application of Additive Manufacturing (AM or 3D printing) to Long Duration Space

Abstract: Additive Manufacturing (AM), also known as 3D printing, has gotten a lot of press in the last 10 years as a solution to repair and maintenance. In the space world, the ability to "print parts on demand" has an understandable attraction, as the logistics and inventory of replacement parts can quickly balloon the mass and volume of the spacecraft when we are designing long-duration (longer than 6 month) missions. But like any seeming "silver bullet", the practical application of AM to spacecraft maintenance and repair is fraught with feedback loops that effect the spacecraft in subtle, and not so subtle, ways. The incorporation of AM capability must start at the design stage, and the reliability of the machines themselves has a knockdown factor on its applicability. So far, AM has been a "curiosity" that has spawned such companies as "Made in Space", but true utilization is in question for future programs. Where will the raw material come from, and what materials make sense? And finally, what will we and can we print? AM must be seen as a solution in the total system context.

Bio: Mr. Anderson co-founded Paragon in 1993. From the time of inception of the company until fall 2014, he was the VP of Engineering and Chief Engineer of the company and was responsible for the design and implementation of not only many of Paragon's technical achievements, but also its processes of engineering rigor in a stepped approach of requirements, design, build, test and delivery. This process has been cited by many customers as unique, disciplined and highly productive. Coming from a background of not only technical but financial and managerial training, he has held diverse positions at Paragon including Treasurer/Secretary, CFO, Sr. VP of Operations, Chief Operating Officer and Director of Manufacturing.

Recognized as a leader in the life support in extreme environments field, Mr. Anderson has led the systems and conceptual design of multiple spacecraft under contract to Lockheed Martin, NASA, Inspiration Mars Foundation and others. He holds multiple patents in a diverse range of disciplines including testing systems, isolation systems, radiator systems and overall systems design. He has led development and qualification of experimental flight hardware for five shuttle flights, two Mir missions, a Russian Progress, and the first commercial payload on ISS. Prior to starting Paragon, Mr. Anderson was the Chief Design Engineer for the International Space Station Solar Array Program–the largest solar arrays ever built–while employed at Lockheed Martin, Sunnyvale, CA.

Mr. Anderson lives in Tucson with his wife of 30 years, Ines, and their three children.

Thursday, October 8th at 4:00 pm

Zoom link: Email eperumala@ariona.edu