



TOPIC # - TDC - 104

LUNAR SURFACE NUCLEAR REACTOR CONCEPTUAL DESIGNS & CONOPS

BACKGROUND

NASA's Fission Surface Power Project aims to develop a small, safe, clean, and reliable nuclear fission reactor that can generate electricity for use on the moon. The reactor would be designed to prioritize safety, including during launch and landing, and to operate without human intervention. NASA has set a target date of delivering a reactor to the moon by the early 2030s, where it would operate for nine years after a one-year demonstration.

<https://www.nasa.gov/centers-and-facilities/glenn/nasas-fission-surface-power-project-energizes-lunar-exploration/>

Three Contractors selected Link:

<https://www.nasa.gov/news-release/nasa-announces-artemis-concept-awards-for-nuclear-power-on-moon/>

Lockheed Martin of Bethesda, Maryland– The company will partner with BWXT and Creare.

Illustrations:<https://www.flickr.com/photos/lockheedmartin/sets/72177720310050928>

Animations:<https://vimeo.com/manage/videos/829198706/45f0fd0981>

YouTube video:<https://www.youtube.com/watch?v=LSIILUKiiGE>

Westinghouse of Cranberry Township, Pennsylvania – The company will partner with Aerojet Rocketdyne.

<https://info.westinghousenuclear.com/news/westinghouse-design-takes-nuclear-power-to-outer-space>

IX of Houston, Texas, a joint venture of Intuitive Machines and X-Energy – The company will partner with Maxar and Boeing.

<https://x-energy.com/media/news-releases/intuitive-machines-and-x-energy-led-team-awarded-5-million-to-provide-a-solution-to-deliver-fission-surface-power-to-the-moon-by-2028>



PROBLEM/DESCRIPTION

Students will research and develop conceptual designs and CONOPS for future lunar surface operations.

DELIVERABLES

1. Modules conceptual designs trades, drawings, layout, analysis & report
2. Power distribution mapping
3. Lunar CONOPS
4. Evacuation CONOPS
5. Lunar Locations

DESIGN TEAM PROFILE

NASA MENTOR:	Robert Nuckols (robertn@axiomspace.com)
LEVEL:	Undergraduate students of any level
MAJOR/DISCIPLINE:	Nuclear Engineering, Electrical Engineering, ME, Civil Engineering
TEAMS:	2
DURATION:	One or Two-Semester Project

