

NASA / Spear Enterprise LLC Joint Technical Report

Adaptive Laser Communications for Space Networks – Final Report (Rev A)

Date: October 12, 2025

Report ID: SDC-COMMS-2025-ALC-001

Prepared by: Spear Enterprise LLC / NASA Collaboration

Routing Memo

TO: ATB Board (SYS-SAFE, ICS-SEC, RELIAB, HFX, STRUCT)

CC: ARCHITECT, MECHWORK, MECSAI, CODEWRITE, QUANTUM, LEDGER

FROM: SDC & COMMS Program (Gary Spear / “Sam”)

DATE: October 12, 2025

SUBJECT: Adaptive Laser Communications for Space Networks – Final Report (Rev A)

ACTION REQUESTED: Quality-First Gate Review (Compliance + ICD Completeness + Risk Assessment)

Executive Summary

This document provides the final NASA-formatted version of the Adaptive Laser Communications for Space Networks report prepared under the SDC & COMMS program. It outlines the research, development, and implementation roadmap for achieving adaptive 100 Gbps laser communication between LEO and GEO spacecraft.

Reviewer Signatures

| Role | Name | Signature | Date |
|----------|------|-----------|------|
| SYS-SAFE | | | |
| ICS-SEC | | | |
| RELIAB | | | |

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|------------------------------|--|--|--|
| HFX | | | |
| STRUCT | | | |
| ARCHITECT (Project Director) | | | |

Revision History

| Revision | Date | Author | Description of Change | Approved By |
|----------|------------|--------------------|---|-------------|
| Rev A | 2025-10-12 | Gary Spear / "Sam" | Initial release, NASA-formatted version prepared for review | ARCHITECT |