

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Advanced Space Communications and Navigation Systems (5)

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EMPLOYING LASER COMMUNICATIONS ON COMMERCIAL GEO SATELLITES A PATH TO
AFFORDABLY DEPLOY DEEP SPACE AND NEAR EARTH HIGH DATA RATE
COMMUNICATIONS**Abstract**

Demonstrating space based laser communications has seen significant recent success. Most notably is the demonstration by NASA's Lunar Laser Communications Demonstration (LLCD) to transmit 622 Mbps from Lunar orbit to Earth ground stations. As the LLCD mission came to an end in April 2014, NASA's redirected its focus to an equally ground breaking next step, Laser Communications Relay Demonstration (LCRD). Within LCRD, NASA is both employing a hosted payload model to affordably operate in geostationary orbit as well as connecting two earth stations with high rate optical links relayed through a geostationary satellite.

NASA's LCRD mission will be hosted on an SSL build commercial GEO satellite to be launched in 2017. LCRD's two year demonstration will precede deployment on and enable NASA's next generation deep space missions as well as Earth orbiting relays.

By hosting LCRD on a commercial GEO communications satellite, NASA's Space Technology Mission Directorate (STMD) and Space Communications and Navigation (SCaN) office have lead the way for US Government missions to be affordably deployed leveraging the existing high reliability GEO ComSat industry. This approach will also be introducing this exciting technology to the commercial industry that could accelerate laser communications development, deployment and applications as well as reducing its overall cost. This public-private collaboration is a model that should be considered for many other technology developments.