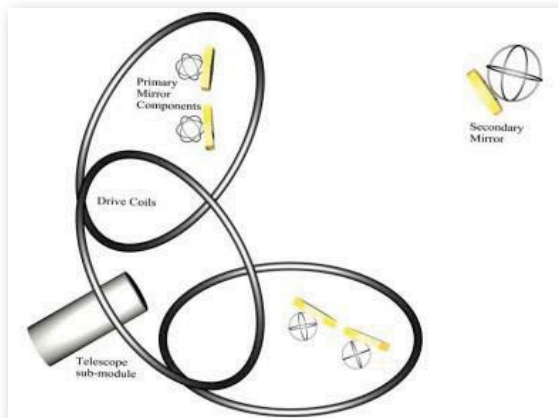


A Far-Field Electro-Magnetic Tractor Beam Project

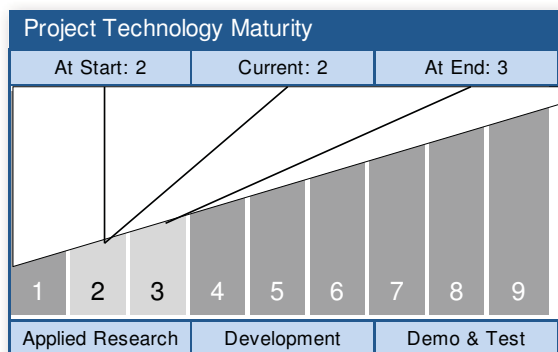
Center Innovation Fund: KSC CIF Program
 Space Technology Mission Directorate (STMD)



ABSTRACT

To demonstrate and model a long range co-operative attractive force between a pair of satellites in order to fly satellite formations for future interferometer and telescope applications.

A Far-Field Electro-Magnetic Tractor Beam



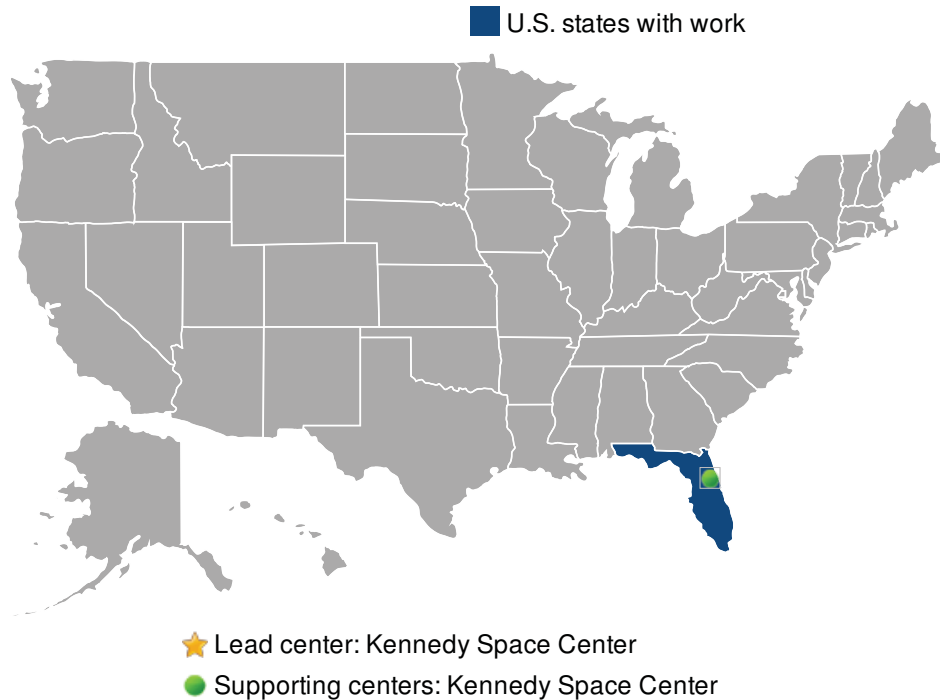
Technology Area: Space Power & Energy Storage TA03 (Primary)
 Ground & Launch Systems Processing TA13 (Secondary)

ANTICIPATED BENEFITS

To NASA unfunded & planned missions:

This technology may allow the eventual construction of a multi-mirror telescope composed of a large number of free flying mirror elements.

Read more on the last page.



DETAILED DESCRIPTION

KSC demonstrated a feasible approach to positioning and orienting a large number of satellites (100 or more) in a rigid and very precise formation. KSC was not successful in the attempt to demonstrate a long range tractor beam, but did succeed for the distances needed for future space telescope construction. KSC experimentally verified the predictions and showed that the entire telescope can be steered to point anywhere in the sky within a few hours, and each element could be held in a stable fashion to the optical wavelength criteria necessary for diffraction limited performance.

MANAGEMENT

Program Executive:
Mino Dastoor

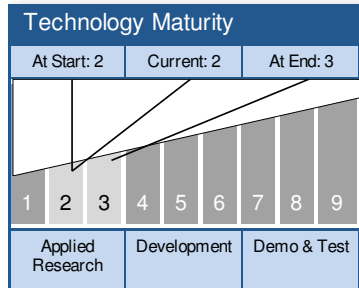
Program Manager:
Nancy Zeitlin

Project Manager:
Nancy Zeitlin

Principal Investigator:
Robert Youngquist

TECHNOLOGY DETAILS

A Far-Field Electro-Magnetic Tractor Beam



TECHNOLOGY DESCRIPTION

KSC demonstrated a feasible approach to positioning and orienting a large number of satellites (100 or more) in a rigid and very precise formation. KSC was not successful in the attempt to demonstrate a long range tractor beam, but did succeed for the distances needed for future space telescope construction. KSC experimentally verified the predictions and showed that the entire telescope be steered to point anywhere in the sky within a few hours, and each element could be held in a stable fashion to the optical wavelength criteria necessary for diffraction limited performance.

This technology is categorized as a hardware system for other applications

- Technology Area
 - TA03 Space Power & Energy Storage (Primary)
 - TA13 Ground & Launch Systems Processing (Secondary)

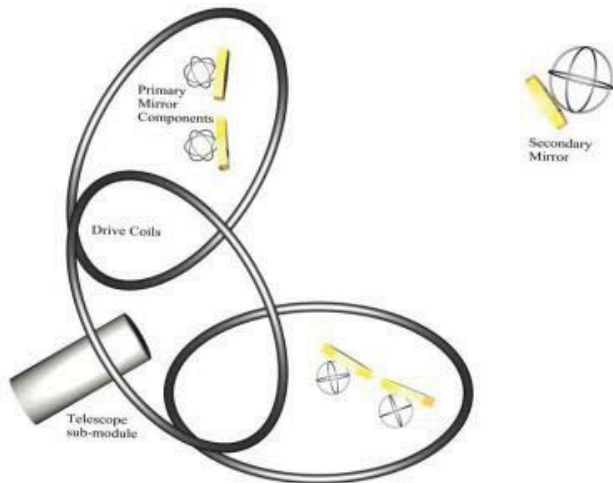
CAPABILITIES PROVIDED

This technology allows a very large number of free floating satellites to exert independent forces and torques on each other, allowing mass motion, i.e. swarming or formation flying.

This technology may allow a large number of independent satellites to work together to accomplish a task or to position a large number of mirrors in a future space telescope.

Performance Metrics		
Metric	Unit	Quantity
number of satellites	no.	100 potential

IMAGE GALLERY



A Far-Field Electro-Magnetic Tractor Beam