NEXT GENERATION

# NGST

SPACE TELESCOPE

# Programmable 2-Dimensional Microshutter Arrays for Multiobject Spectroscopy on NGST

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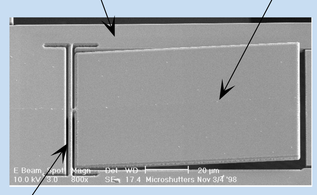
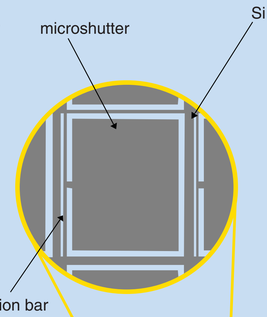
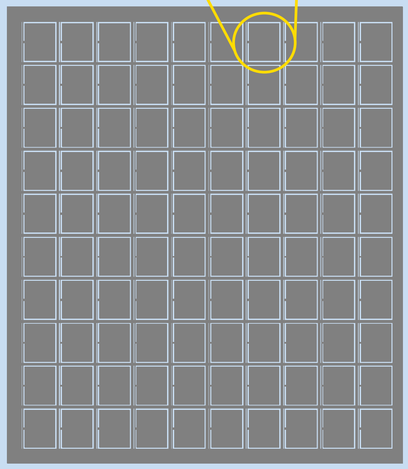
## Single shutter

MODEL



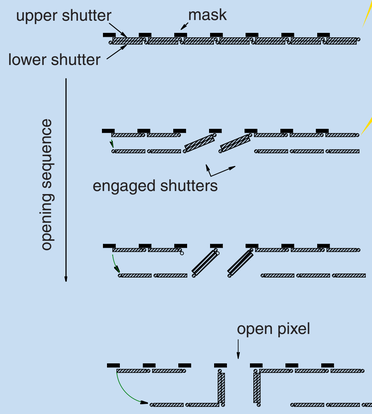

CONCEPT



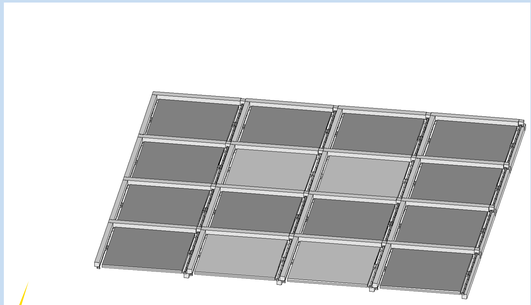
array of microshutters

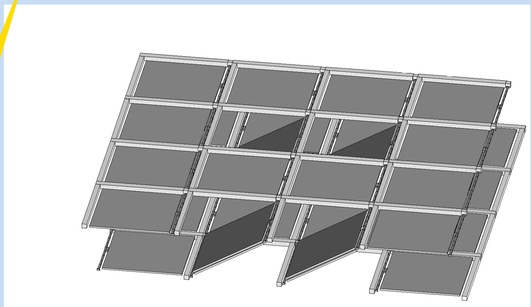
## 2D view

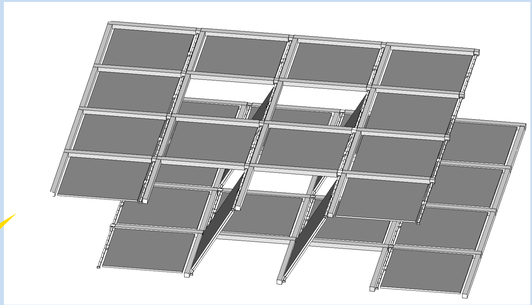


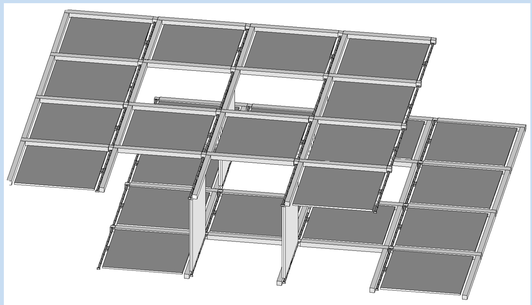

Sequence of the microshutter opening (sideview). Microshutter blades are represented by the shaded rectangles. Shaded circles are torsion bars. Two blades are engaged to have one pixel open.

## 3D view









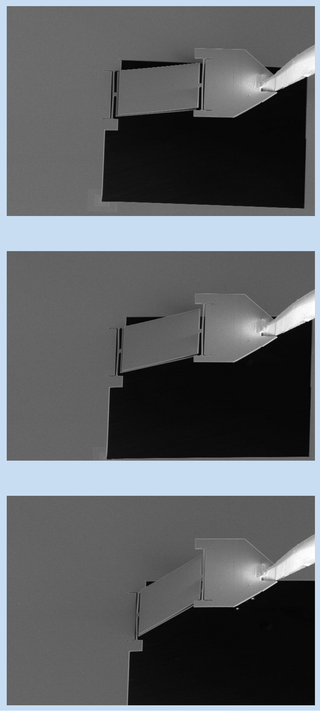
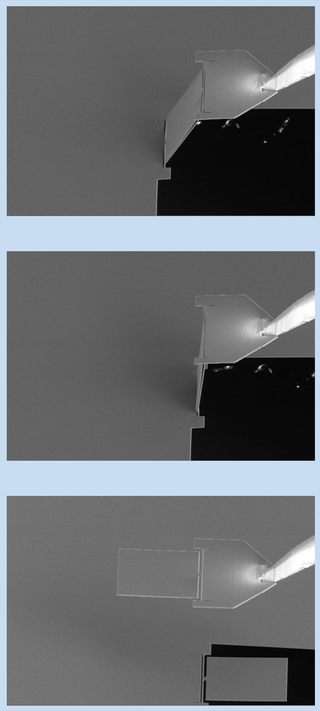
We report progress on the development of a two-dimensional array of microshutters which can be used as a high efficiency, high contrast field selection device for a mutli-object spectrometer. The device is a close-packed array of shutters, with a typical size of 100 microns square and area filling factor of up to 80%. Each of the shutters is individually selectable. Since the device works in transmission, there is no loss of contrast due to diffraction from the edges of unactuated pixels. The device can also be used as a micromirror array similar to DMD developed by Texas Instruments.

Each shutter, made of single crystal Si with an appropriate optical coating, pivots on a torsion flexure along one edge. Shutters were made at the Lab for Ion Beam Research and Application (LIBRA) of Prof. Jon Orloff of the University of Maryland. Wafers were prepared and thinned by Christine Allen of the GSFC Detector Systems Branch.

SEM images of the fully functional single shutter.

shutter engaged ...

open ...



and disengaged