

# Preparing the way to space borne Fresnel imagers

## Space scenarios optical layouts

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Received: 20 April 2010 / Accepted: 26 September 2010 / Published online: 23 October 2010  
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**Abstract** The Fresnel Diffractive Array Imager (FDAI) relies on diffraction focusing to potentially output very high wavefront quality particularly in the Ultraviolet. After Chesnokov (Russ Space Bull 1(2), 1993) or Barton (Appl Opt 40(4):447–451, 2001), we intend to develop tangible optical designs for space missions at the horizon 2025. This paper refers to the phase 0 study completed at CNES. We canvass here different optical scenarios adapted to space formation flying, discussing the technologies involved, their level of maturity and criticality. Large spectral domains were investigated from Lyman- $\alpha$  to Infra-Red, with competitive aperture size and ambitious objectives. We conclude by a 4-m class UV space mission scenario that could be the first launched imager of this kind.

**Keywords** Ultraviolet · Fresnel diffractive mirror · Grating · Ultra-fine navigation

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