Exp Astron (2011) 30:205–216
DOI 10.1007/s10686-011-9223-8

ORIGINAL ARTICLE

The Fresnel space imager as a disk evolution watcher

Ana Inés Gómez de Castro

Received: 9 December 2010 / Accepted: 11 April 2011 / Published online: 10 May 2011

Abstract The Fresnel Diffractive Imaging Arrays form high resolution images by diffraction with low radiometric efficiencies. They are extremely good devices to make high resolution imaging and integral field spectroscopy of bright sources. Thirty meter arrays will provide a spatial resolution of 0.8 mas at Lyman-α that will open a completely new field of research: the study of matter distribution around disks and their gravitational drives. In this contribution, the potentials of the 3.6 m precursors (or probes) for astrophysical disks and jets research, are described. Main emphasis is made on young planetary disks.

Keywords Young planetary disks · Protostellar jets · Pre-main-sequence stars · Ae/Be Herbig stars · T Tauri stars

1 Introduction: disks physics

Among the main scientific drivers for the next generation of UV instrumentation, the understanding of astrophysical disks, in a broad sense, stands up at front. After stars, disks are the most common structures in the Universe. Disks are constituted by stars (as in disk galaxies), by dust, rocks and planetesimals (as in debris disks around stars) and also by gas. Gaseous disks are observed around compact objects in interacting binaries and around young stars. They are widely believed to occur around massive black holes in the active galactic nuclei (AGNs) of galaxies. In general, disks form whenever the material within them cools on a shorter time scale than the time in which they can transport

A. I. Gómez de Castro (✉)
Facultad de Ciencias Matemáticas, Universidad Complutense de Madrid,
Plaza de Ciencias 3, 28040 Madrid, Spain
e-mail: anai_gomez@mat.ucm.es