

Primordial Origin of Magnetic Fields in the Galaxy & Galaxies

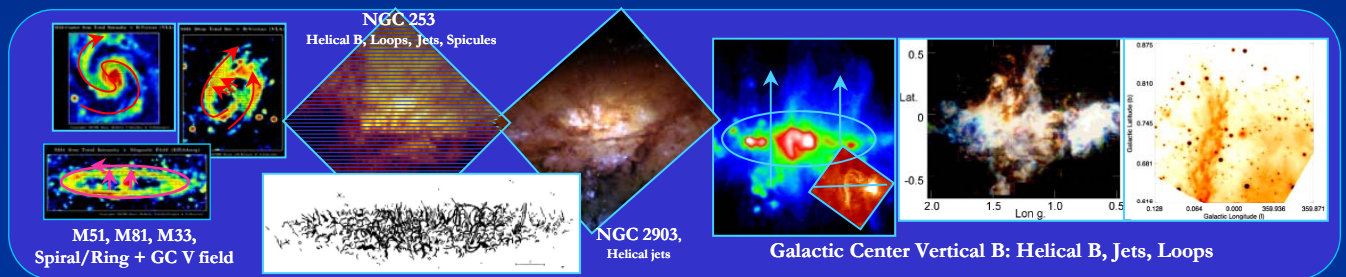
- Tight Link between GC and Cosmic B -

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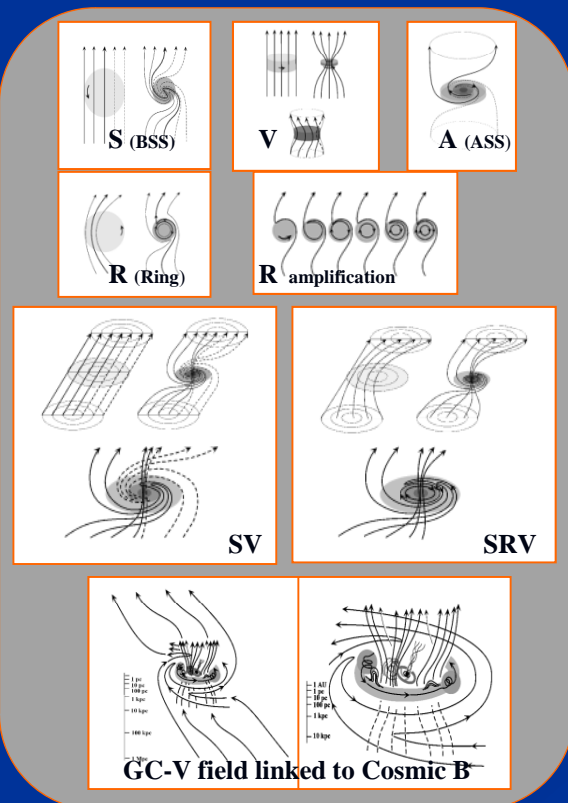
Abstract

Observations indicate S (BSS, bisymmetric Spiral), A (ASS, axisymmetric), R (Ring) fields in galaxy disks, and V (Vertical) field in the center, which accelerates cosmic jets. The magnetic topology is explained as the fossil of large scale primordial field wound up during the galaxy formation. MHD simulations successfully reproduce the composite field configurations. The vertical fields in the Galactic Center are deeply linked to intergalactic cosmic magnetic fields.

1. Vertical B in GC and Spiral/Ring/Loop Fields in the Disks

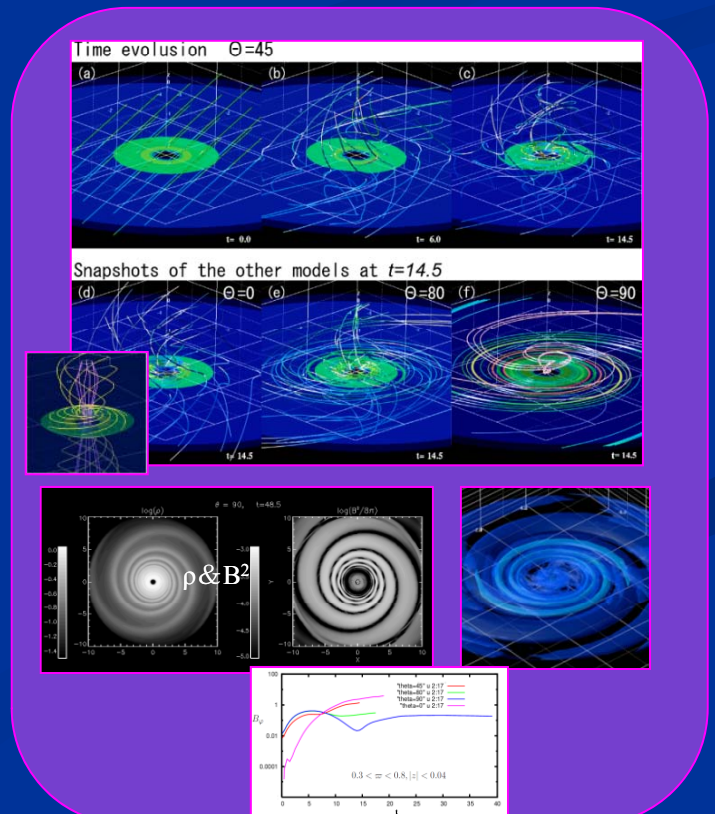


2. Primordial origin for S, A, R, & V fields (a,b)



3. MHD Simulation (b)

$\theta=0, 45, 89, 90$ deg, 10 kpc disk



References: (a) Sofue et al. 1986 ARAA 24, 459; (b) 2009 PASJ submitted