A Deep X-ray View of the Small Magellanic Cloud

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MOTIVATION

- Deepest X-ray luminosity functions (XLFs) for extragalactic X-ray binaries (XRBs) ever recorded:
  - XRB formation efficiency = f(age)
  - XLF evolution up to 100 Myr (& influence of propeller effect)
  - Duty cycles of accreting pulsars
  - Parameters relevant to XRB formation & evolution
  - SNRs, early-type stars, late-type coronal sources

SURVEY DESCRIPTION

- Cycle 14 XVP (PI A. Zezas)
- 11 fields sampling different stellar populations & 3 archival fields with similar exposures (100 ks/field; split in 2 allowing source variability studies)
- Total exposure: 1.1 Ms
- Total area: ~1.1 deg²
- Limiting flux: ~1.2 x 10⁻¹⁵ erg/cm²/s (0.5 – 7 keV)
- Ancillary multi-wavelength coverage: XMM-Newton, CTIO/ESO, MCELS, OGLE-III, MCPS, Spitzer, Herschel

FIRST RESULTS

- ~1015 sources detected at 5σ significance level
- (limiting L_X ~ 5 x 10³² erg/s, 0.5 – 7 keV)
- ~ 65 (Wing) – 75 (Bar) sources per field
- 20 pulsars detected
- (out of the 34 known in these regions)
- 2 new pulsars
- 56 sources associated with an OB star from the MCPS catalog (Zaritsky+2002, AJ, 123, 855) within 1.5''
- 12 SNRs detected

Background image: “True color” unsmoothed mosaic of the 14 SMC fields used in this study. Red, green and blue correspond to 0.5-1.2 keV, 1.2-2.0 keV, and 2.0-7.0 keV