Progenitor constraints for core-collapse supernovae from *Chandra* X-ray observations

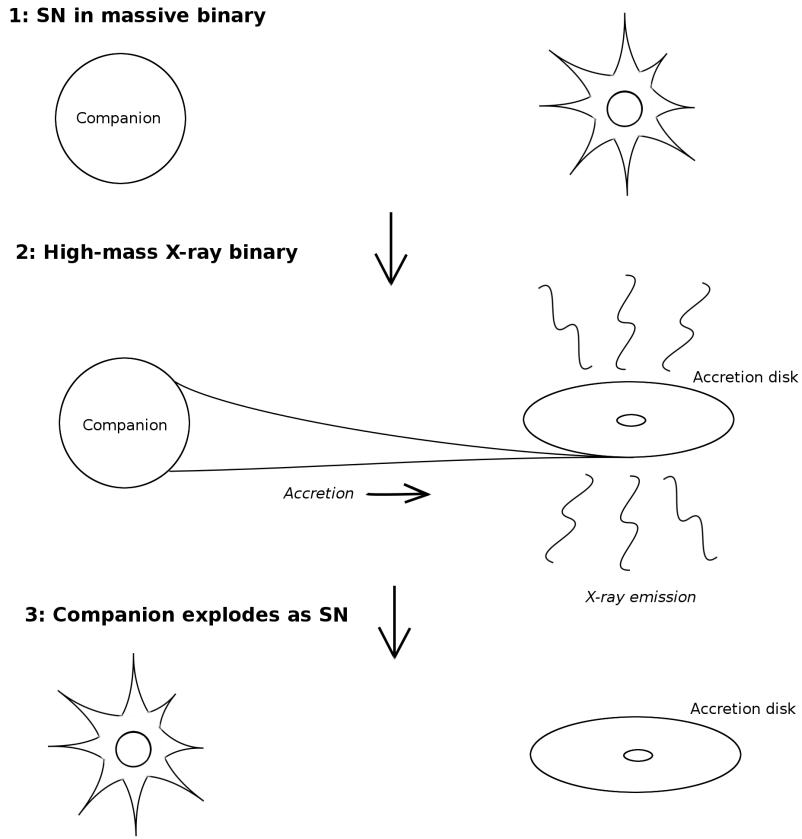
Teppo Heikkilä (Tuorla Observatory, University of Turku)

EWASS, Athens, 8.7.2016

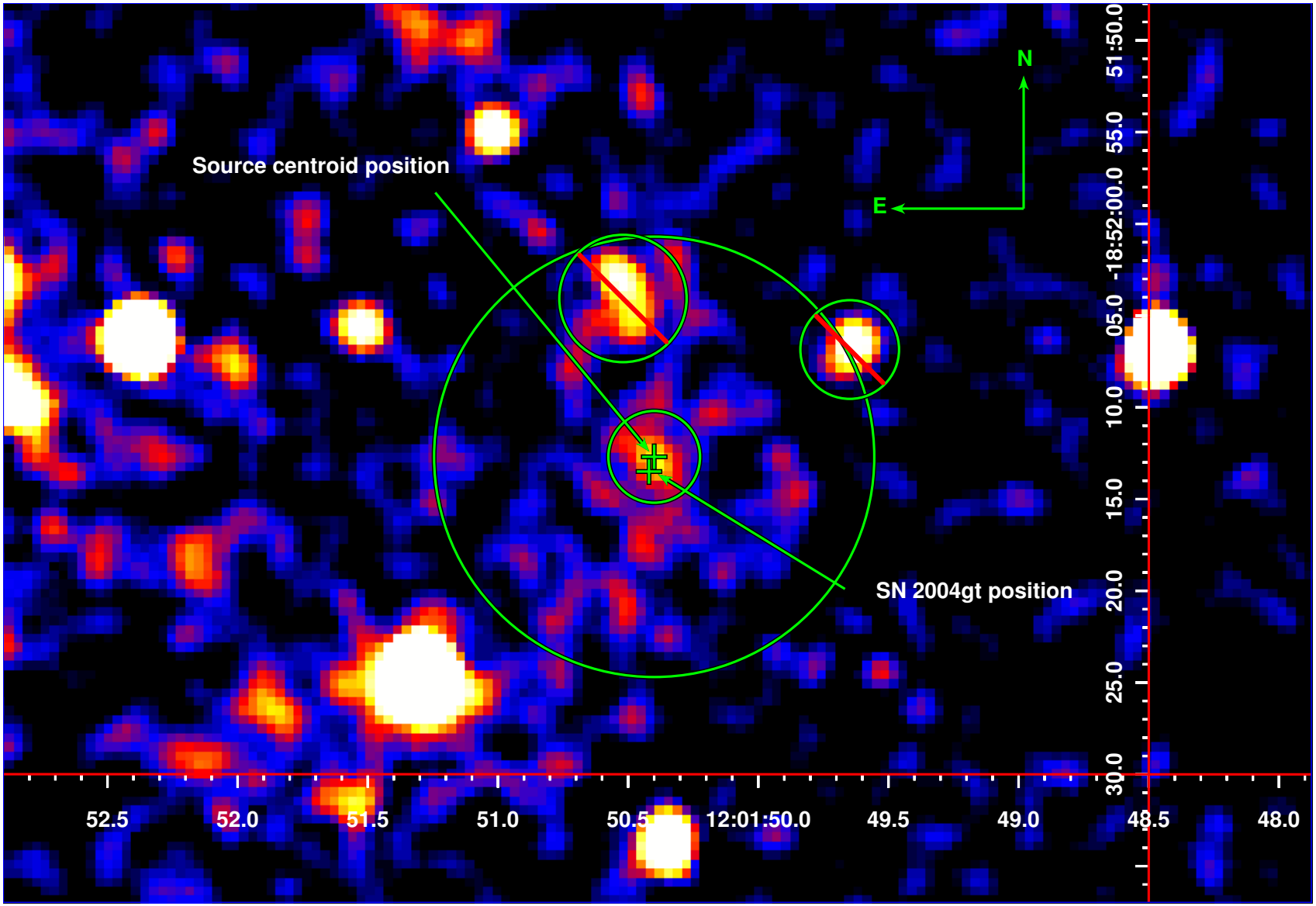
(T. Heikkilä, S. Tsygankov, S. Mattila, J.J. Eldridge, M. Fraser, J. Poutanen, 2016, MNRAS 457, 1107)

X-ray bright core-collapse SN progenitors: Binary interaction scenario

- Hydrogen-poor core-collapse SNe have shed their outer hydrogen envelopes before the explosion (SN types Ib, Ic, IIb)
- One mechanism for losing the envelope is binary interaction
- Possibility of X-ray bright SN progenitor: High-mass X-ray binaries
  - One star has already exploded as SN previously
  - Mass transfer from companion to neutron star or BH produces X-ray emission
  - Companion explodes as stripped-envelope SN
- We searched for pre-explosion X-ray sources for stripped-envelope SNe from *Chandra* archival data
  - Pre-explosion data available for 18 SNe
  - Two sources that could be associated with SNe
    - SN 2004gt
    - SN 2009jf (Voss et al. 2011)
    - SN 2010O (Nelemans et al. 2010) could not be confirmed
  - X-ray luminosity upper limits established for the progenitors of the other SNe in the sample



SN 2004gt / CXOU J120150.4-185212



Pre-explosion upper limits