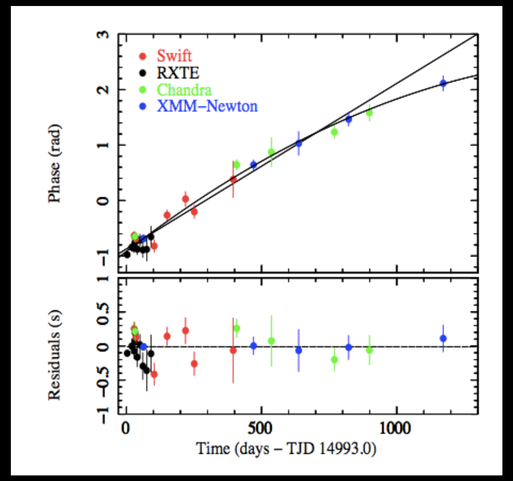
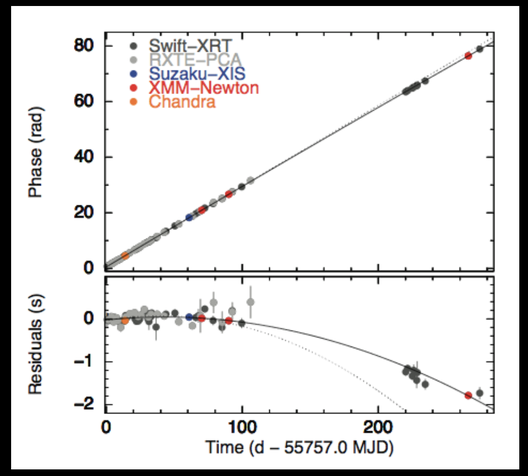
"LOW FIELD" MAGNETARS



$B = 6.2 \times 10^{12}$ G

SGR J0418+5729

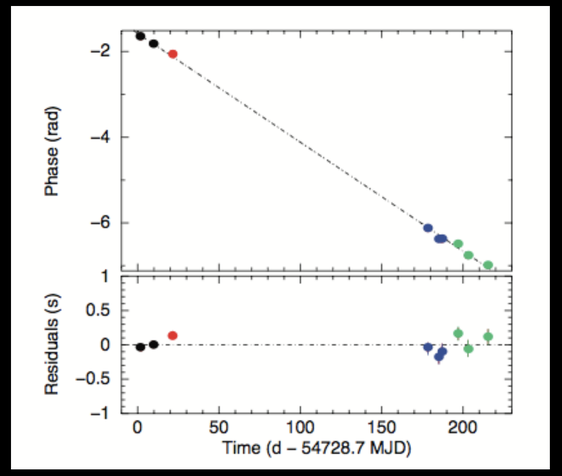
Rea et al. 2010, Science
Rea et al. 2013, ApJ



$B = 2.3 \times 10^{13}$ G

Swift J1822-1606

Rea et al. 2012, ApJ
Scholtz et al. 2012, ApJ

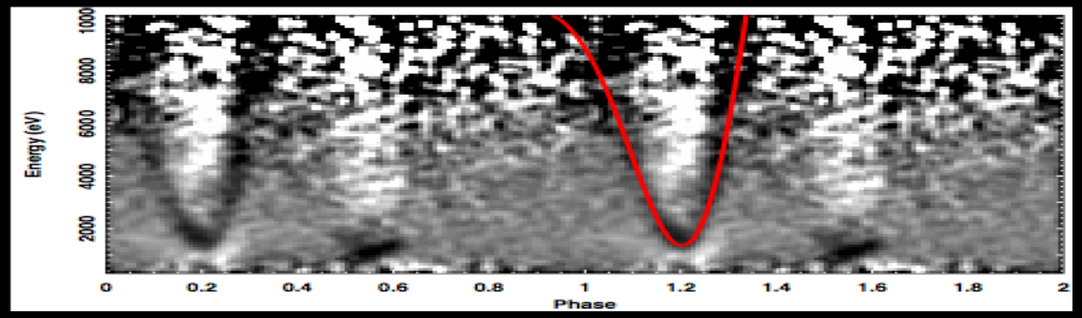


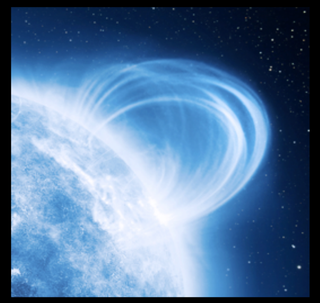
$B < 4 \times 10^{13}$ G

3XMM J1852+0033

Rea et al. 2014, ApJL
Zou et al. 2014, ApJL

A magnetar with a dipolar field of 10^{12} Gauss, and loops reaching 10^{14} Gauss.

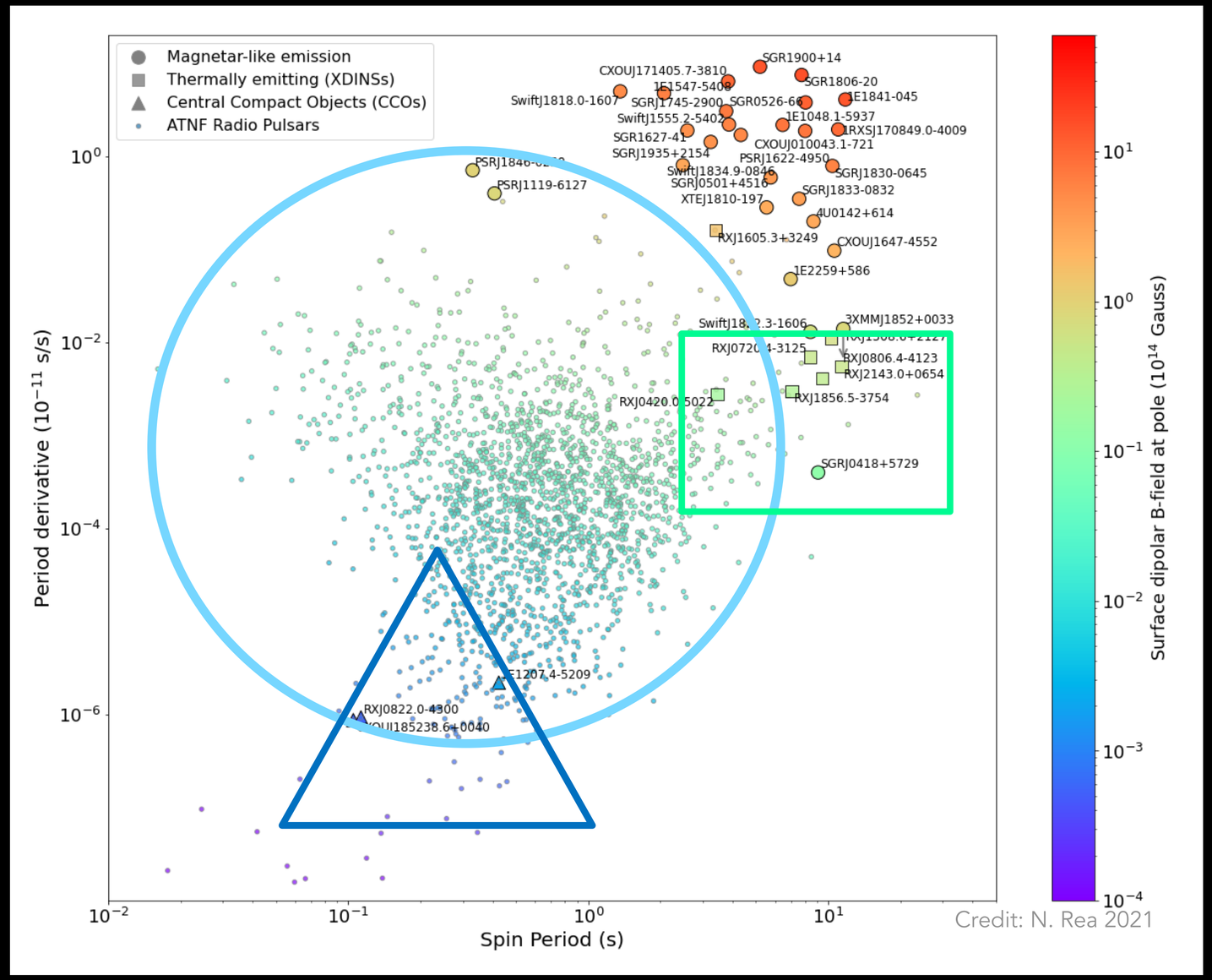


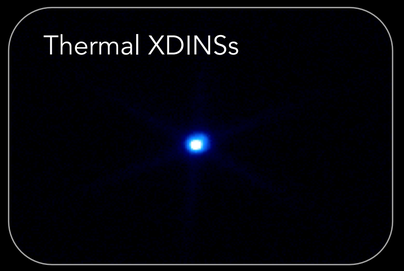


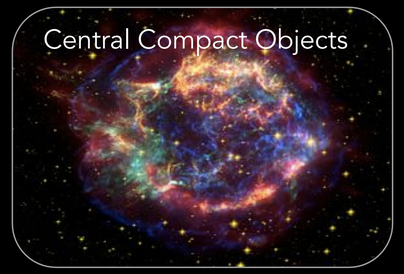
$E_{cycl,p} = 0.6\ B_{14}$ keV
$\Rightarrow B_{loop} \sim (2\text{-}20) \times 10^{14}$ G

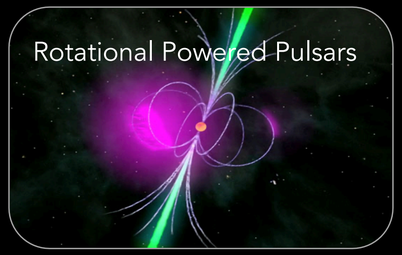
Tiengo et al. 2013, Nature

THE ISOLATED PULSAR POPULATION









THERMAL NSs (XDINS)

Powered by magnetic energy.
Old, almost pure blackbodies.
Typically emitting in the X-rays.

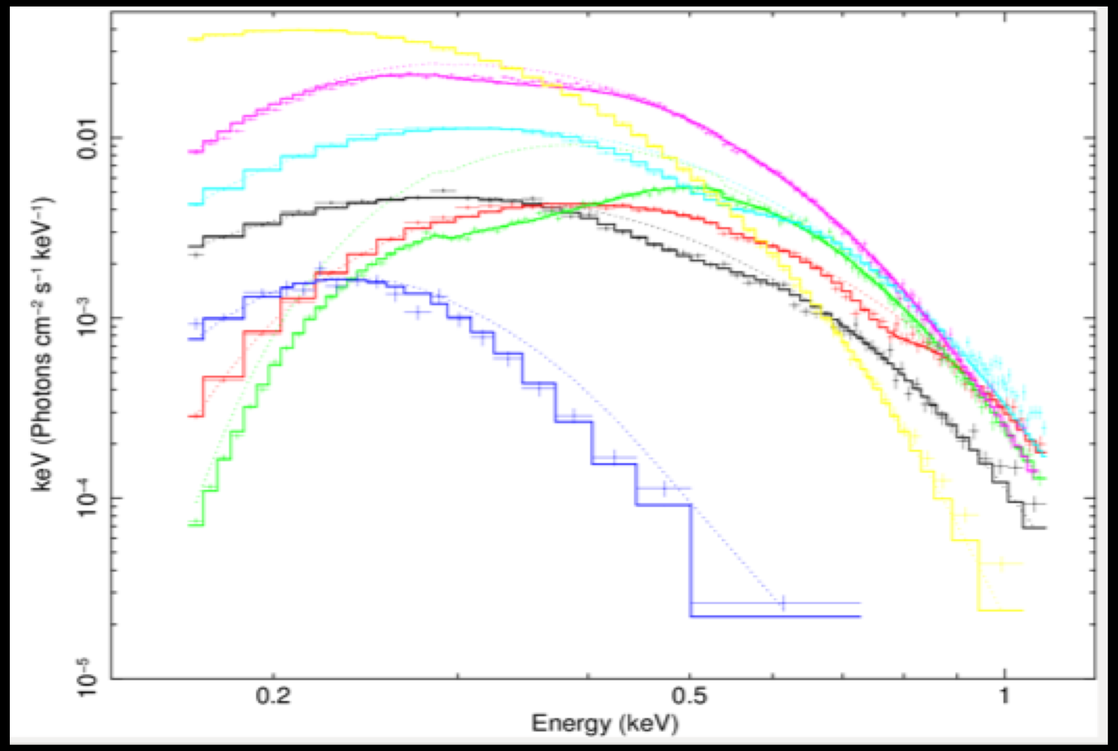
CENTRAL COMPACT OBJECTS

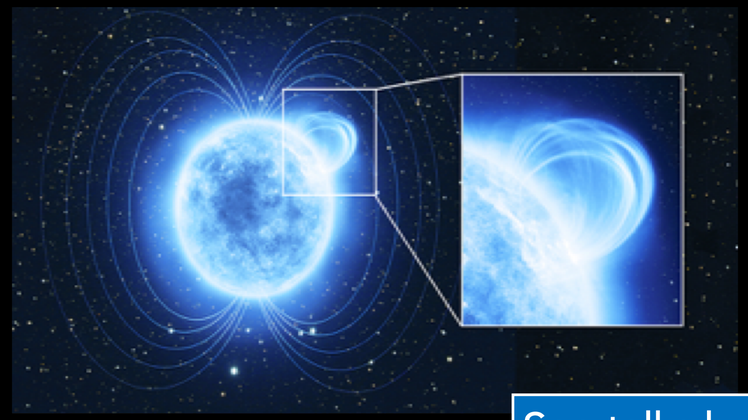
Powered by magnetic energy.
Young, with bright SNRs.
Typically emitting in the X-rays.

ROTATIONAL POWERED PULSARS

Powered by rotational energy.
Typically emitting in radio.

THERMAL EMITTING NEUTRON STARS (XDINSs)

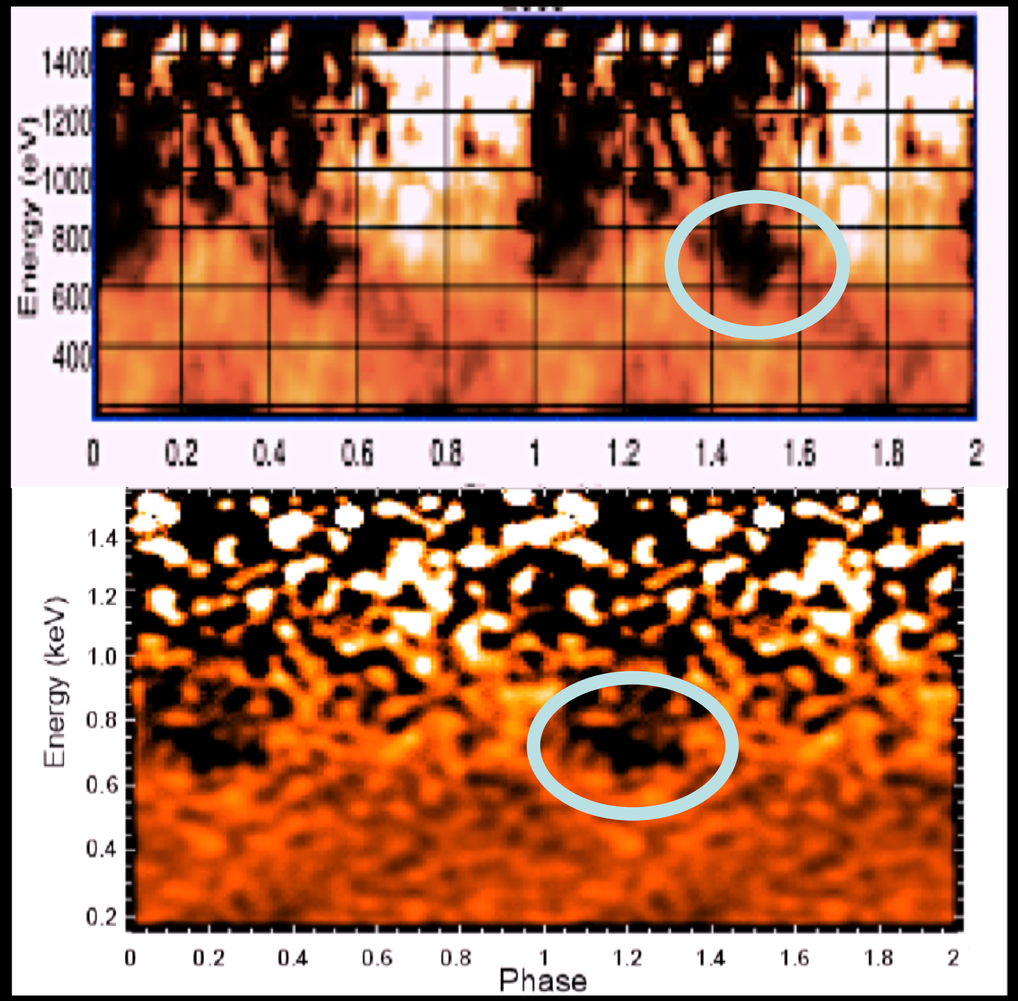




$B_{loop} \approx 1.8 \times 10^{14}$ G
($B_{dipole} \approx 2.5 \times 10^{13}$ G)

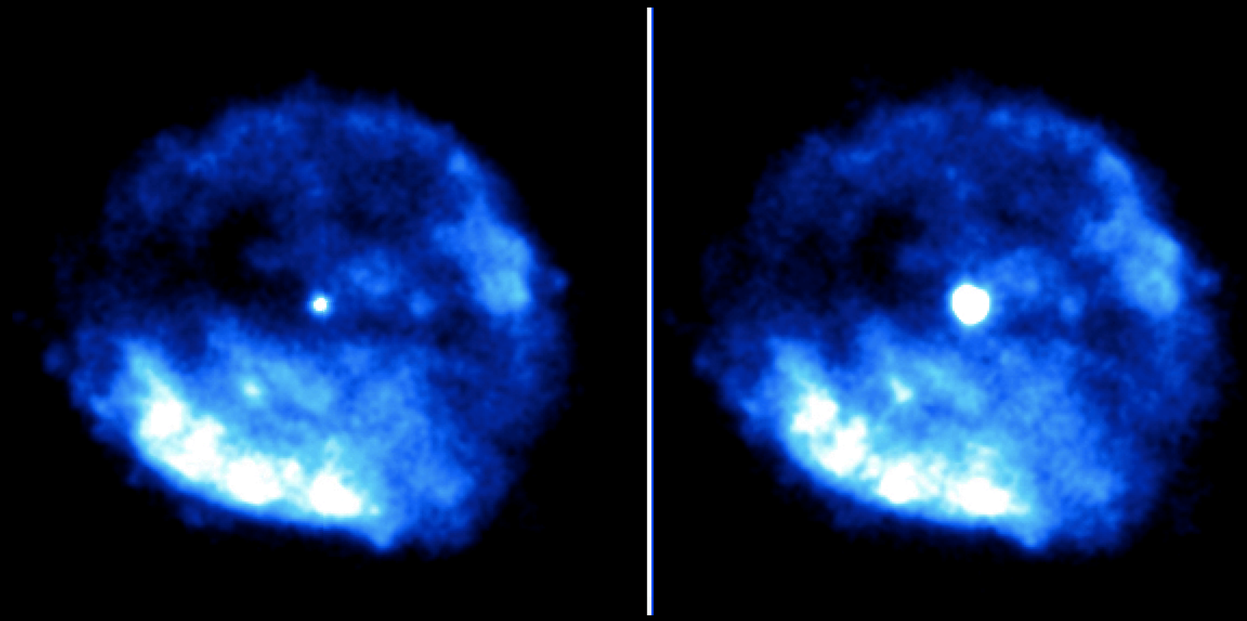
(Borghese, et al. 2015, 2017)

See talks by Mancini Pires and Rigoselli!



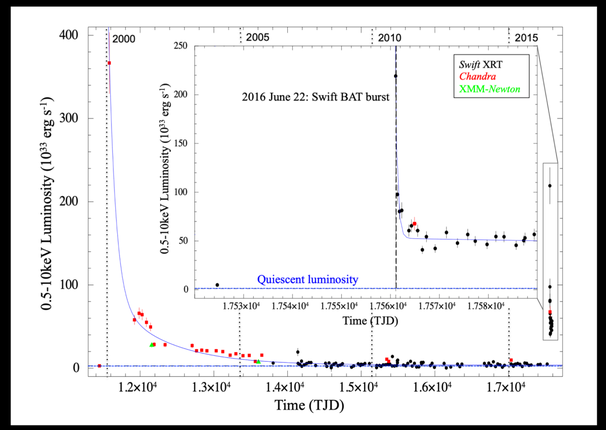
Similar to the low-field magnetar, XDINSs have dipolar fields of 10^{13} Gauss, and loops reaching 10^{14} Gauss.

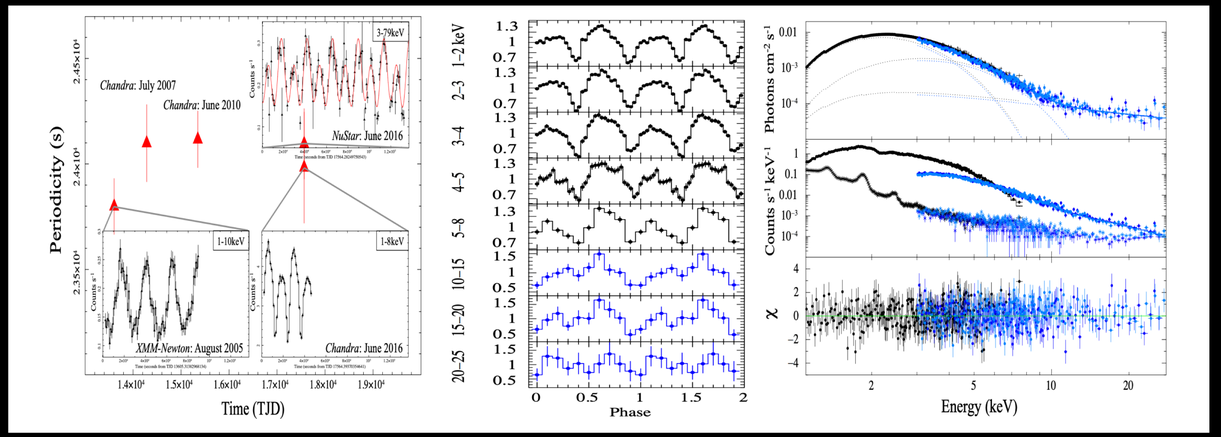
CENTRAL COMPACT OBJECTS



A magnetar-like event from a CCO with a 6.4hr spin-period!

Fall back accretion after the supernova could make this pulsar slow down so extremely…





(D'Ai et al. 2016; Rea et al. 2016, Ho & Andersson 2016, Borghese et al. 2018)