



X-ray news from RW Auriga: Optical dimming associated with iron rich corona and exceptionally high absorbing column density

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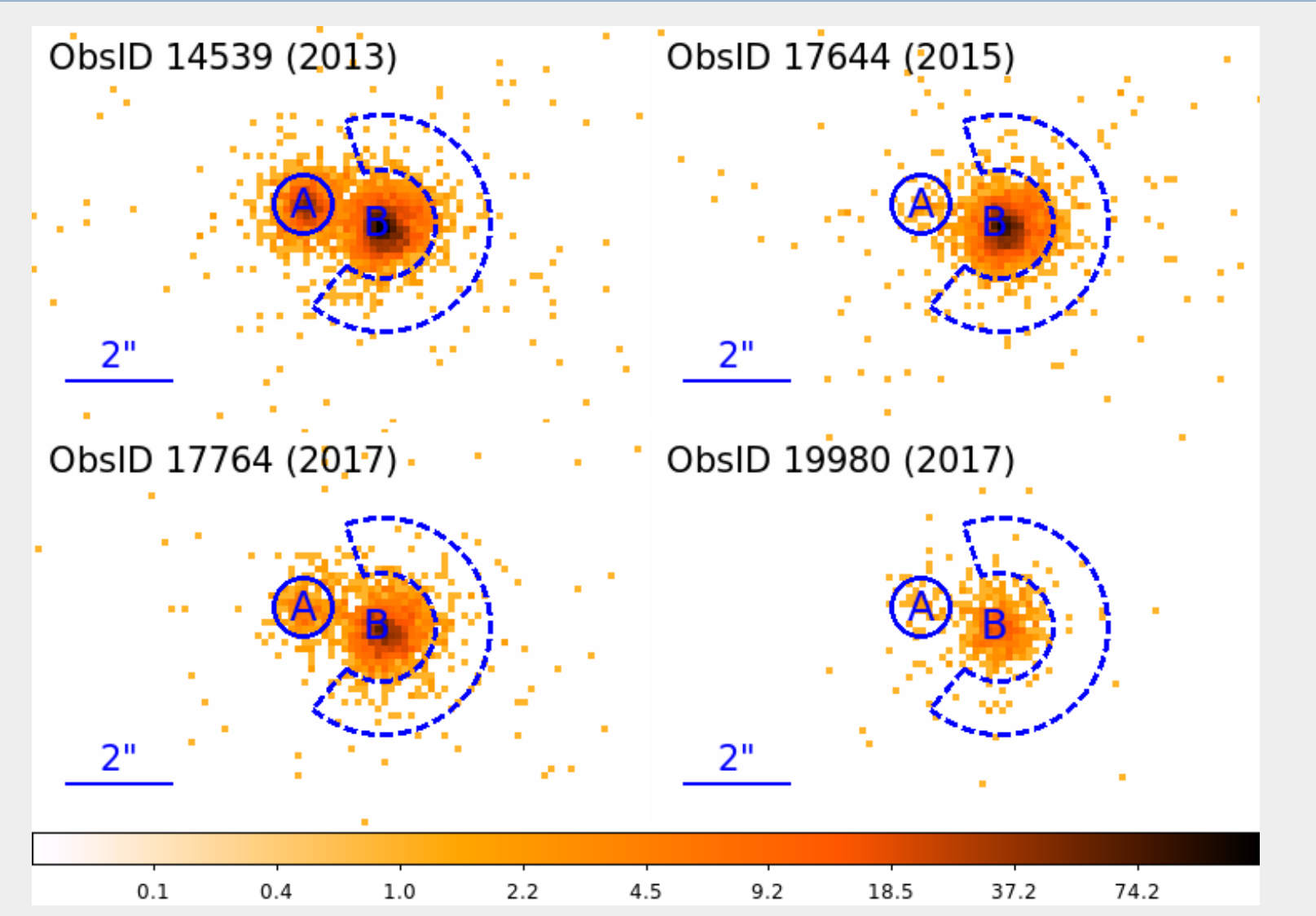
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RW Aur A

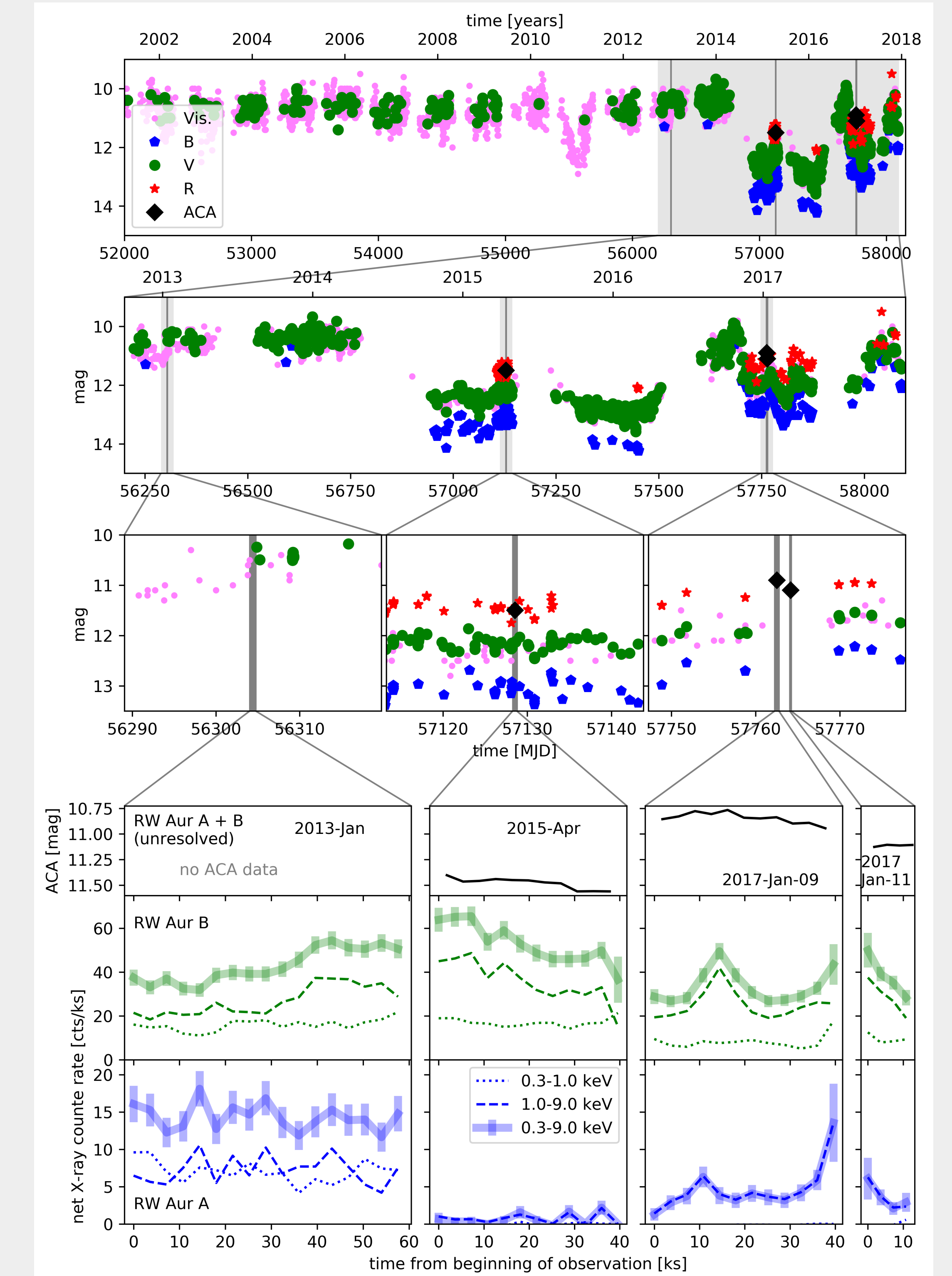
- Physically bound with RW Aur B (semi-major axis 200 au)
- Age: 10 Myr
- Distance: 140 pc
- Mass: 1.4 solar masses
- Active accretion disk

Chandra images

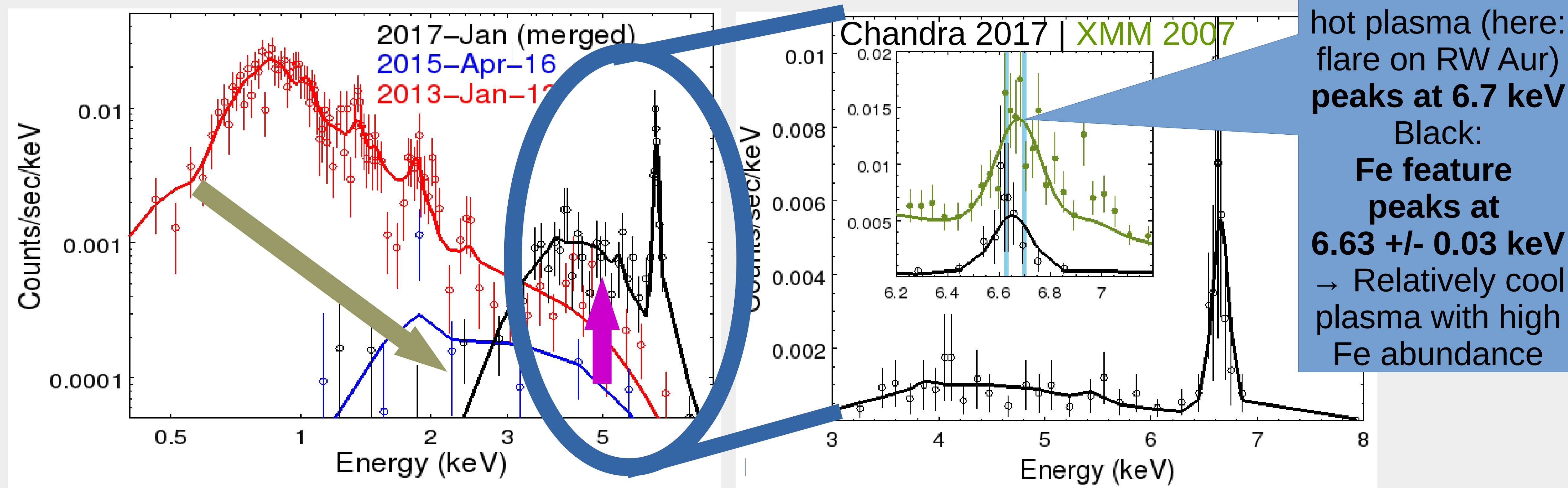
- Binary resolved (blue regions are spectral extraction regions)
- Cross-contamination low and can be modeled.
- RW Aur A variable



Optical and Chandra lightcurve



Chandra spectra: Vastly different every time we look



Green: hot plasma (here: flare on RW Aur) peaks at 6.7 keV
 Black: Fe feature peaks at 6.63 +/- 0.03 keV
 → Relatively cool plasma with high Fe abundance

We observe: between 2013 and 2017

- emission at high energies multiplies
- absorbing column density N_H increases by 400 to $4 \times 10^{23} \text{ cm}^{-2}$
- Fe abundance in corona increases from 0.5 to 15 times solar

We infer a large supply of Fe rich, large grains in the inner disk.

Absorber

- Optical extinction is grey → thick absorber or large grains
- N_H/A_V skyrockets: gas rich absorber? (or at least non-ISM grains)

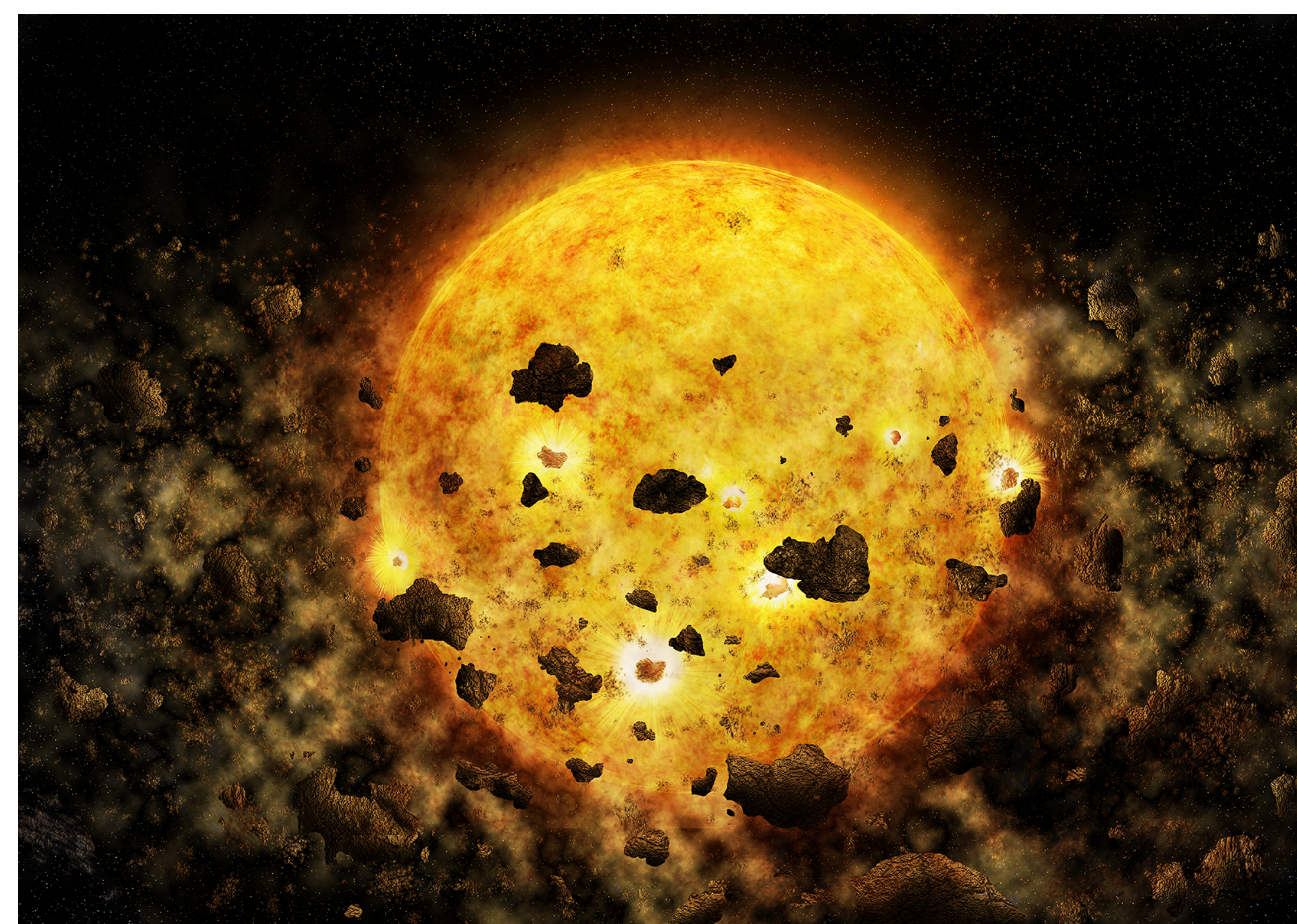
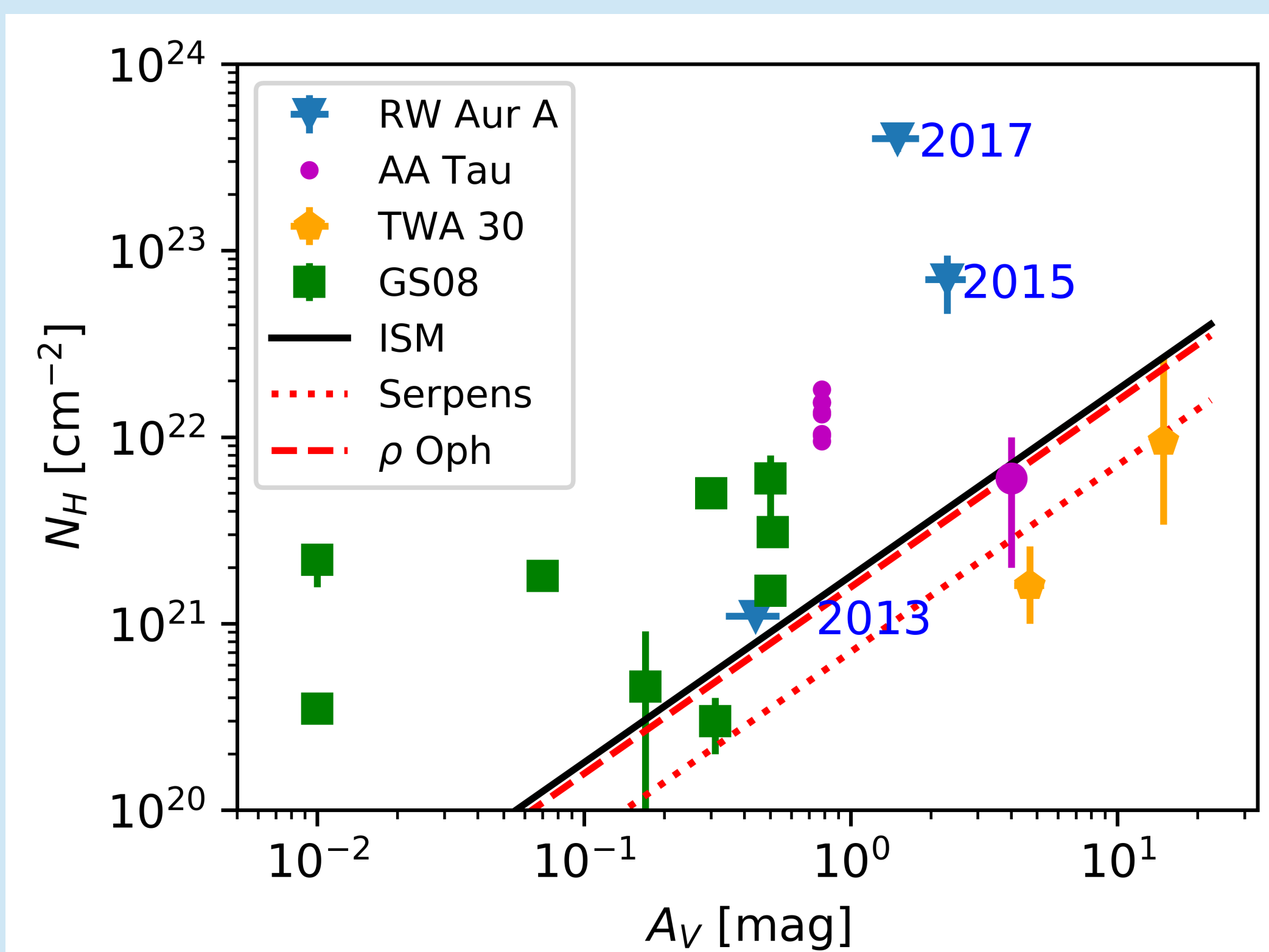


Image credit: NASA/CXC/M. Weiss;

Where does it come from?
 Ideas:

- 1) Break up planet(esimal) with Earth-like Fe core (e.g. due to collision).
- 2) Collect dust in dust trap, then release due to some massive disturbance in the inner disk.