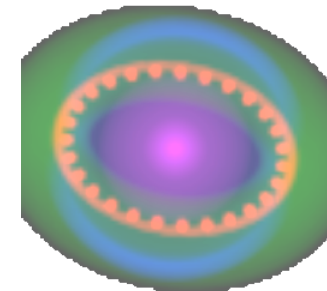
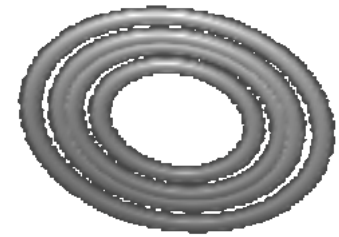
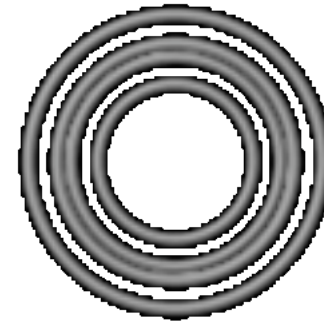
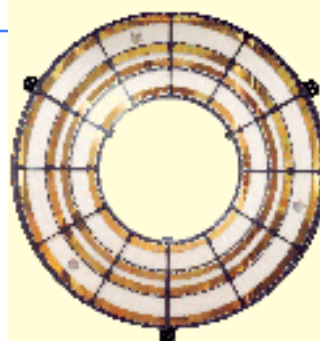




MIT Kavli Institute  
for Astrophysics  
and Space Research



# HETG - Status

*Chandra* Quarterly Review No. 22, 23 January 2007

Dan Dewey  
dd@space.mit.edu

HETG IPI: Prof. C.R. Canizares  
MIT Kavli Institute



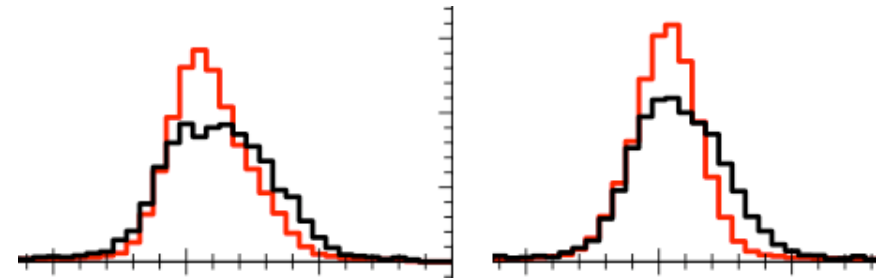
# Ongoing HETG Team Activities Summary

---

- HETG Performance (August 2006 - mid-Jan 2007)
  - 25 HETG obsids on 13 targets; Orion GTO, No Cal.
  - Monitoring HRMA FWHM: one obs. Added - OK.
    - List of bright point sources observed with HETG
      - ⇒ [http://space.mit.edu/HETG/technotes/zo\\_1d/focus\\_trends.061026.rdb](http://space.mit.edu/HETG/technotes/zo_1d/focus_trends.061026.rdb)
  - HETG performance is nominal.

- HETG Calibration

- Recent work:
  - **SNR E0102 for cross-calibration**
- Current work:
  - HEG cross-dispersion asymmetry (initial work by Ishibashi)
  - **Extended sources observed with HETG**
    - ⇒ Use for: Zeroth-order calibration, Pileup effects, Streak calibration
  - LETG-ACIS Capella observation for precise Rowland spacing (obs ~ April 9th)
- Future work:
  - Higher-orders' calibration

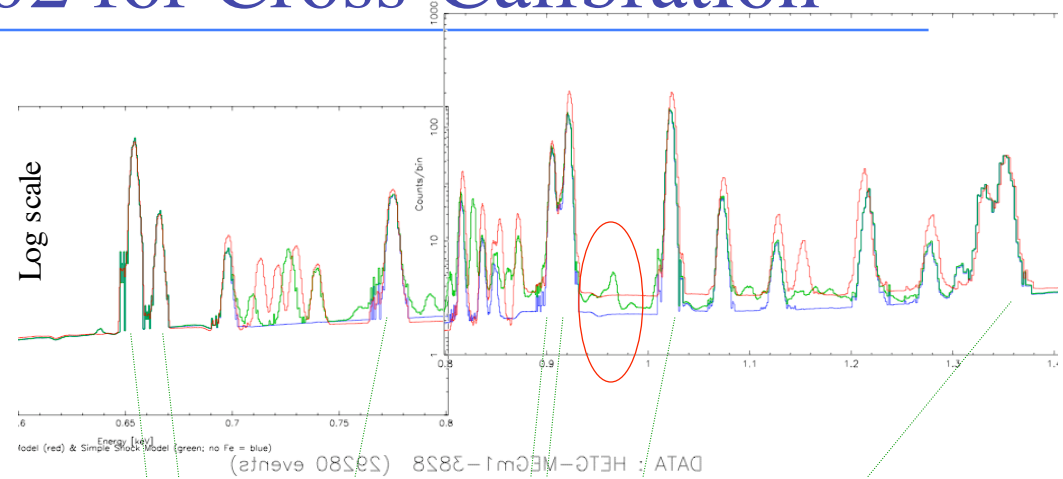


What lines are present?

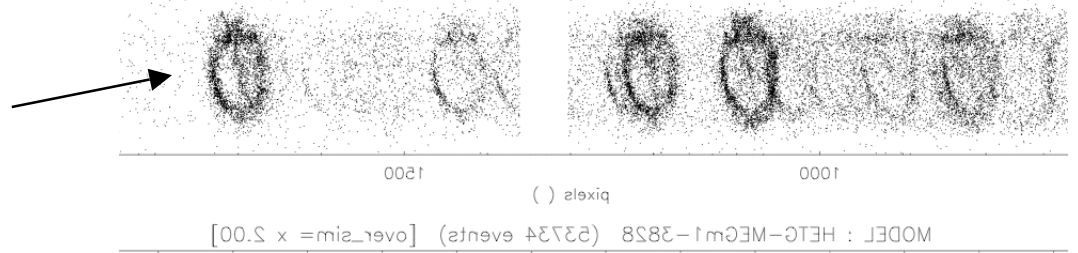
Comparing two Models:

The **Pollock model** is shown in Red

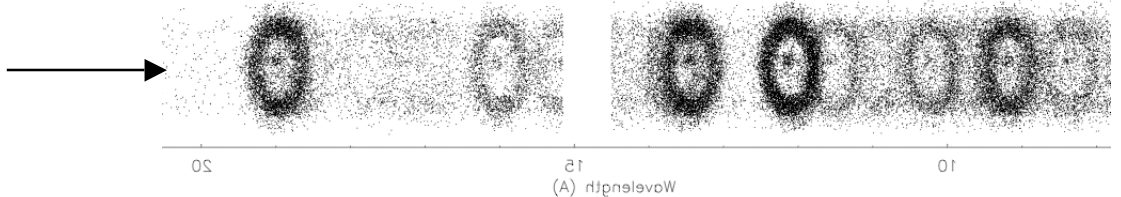
The **Shock model** in Green. To emphasise where Fe lines are in the shock model, the shock model *without* Fe included is shown as the Blue line.



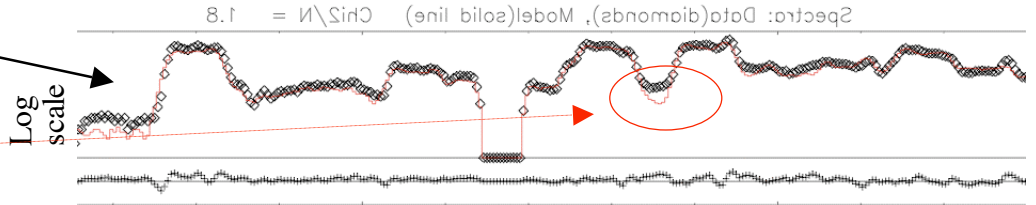
The **real data** as seen by the HETG/MEG grating shows the clear presence of the major lines and hints of the minor lines.



The Pollock model with a simple geometry gives this dispersed image:

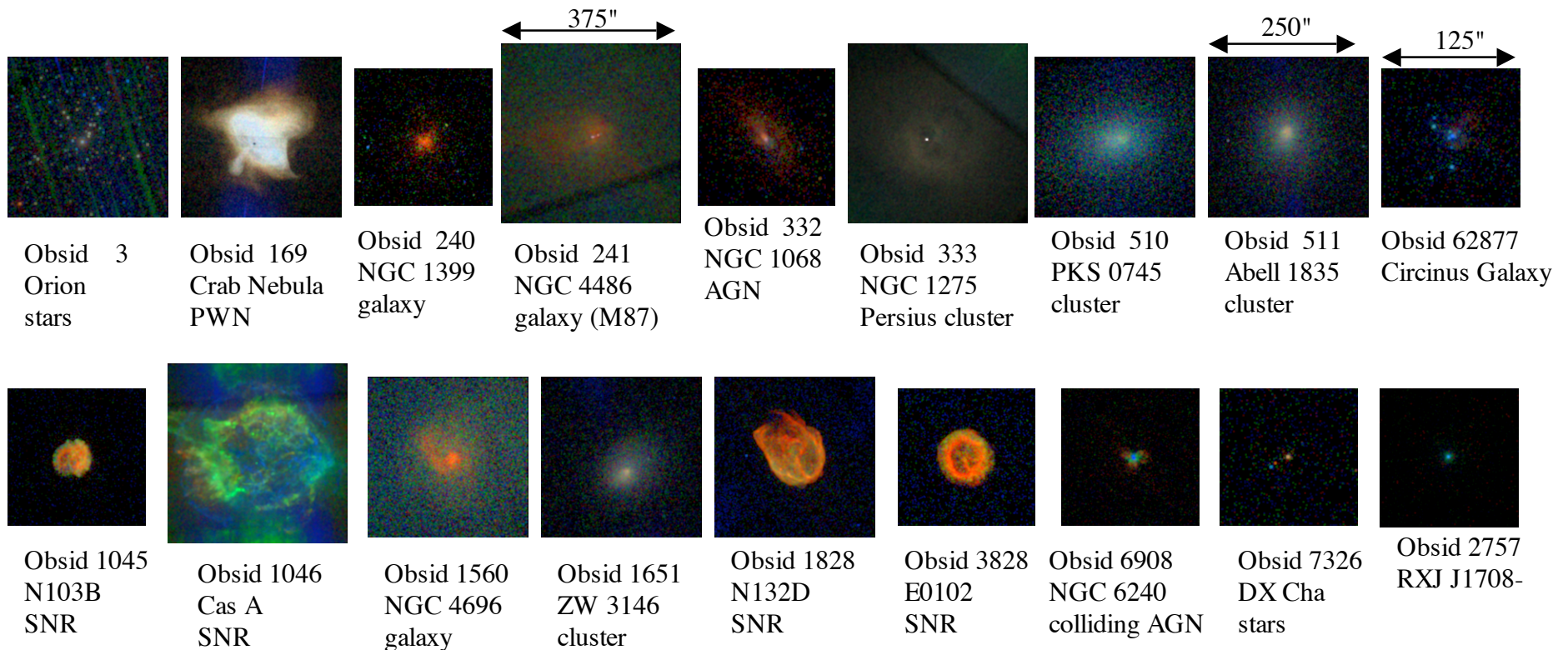


Comparing the two by a simple 1D projection shows general agreement and a hint of discrepancy.



# HETG Cal., cont. --- Extended Sources (GTO)

- HETG observations: Point Sources, Extended Sources
- List of *bright* Point Sources observed with HETG
  - ⇒ [http://space.mit.edu/HETG/technotes/zo\\_1d/focus\\_trends.061026.rdb](http://space.mit.edu/HETG/technotes/zo_1d/focus_trends.061026.rdb)
- List Extended Sources observed with HETG
  - Starting with ones in GTO observations (mostly ours):





## Ongoing HETG Team Activities, cont.

---

- Science Support to CXC, etc.
  - Yearly *Chandra* Newsletter article... working...
  - X-ray Grating Spectroscopy Workshop in July, <http://cxc.harvard.edu/xgratings07>
- GTO Science Program
  - Cycle 8 observations: scheduled/beginning
    - Orion Trapezium: ~ 90 ks of 150 ks
    - Coming soon: **SNR 1987A - see next page.**
      - ⇒ 3D Modeling Software
  - GTO Target selection for Cycle 9 beginning
  - Postdoc status:
    - 4 currently, 2 from Sept.'07 on
    - Possible 3rd in future (~ 50% from HETG)
    - A post doc starting Fall 2007 would nominally include FY08, FY09 and FY'10:
      - ⇒ When can the funding status for FY'10+ be firmed up ?







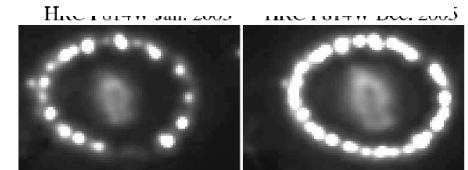
# HETG GTO Science: SNR 1987A in 20th year

- 20 years since SN explosion on Feb.23 1987.
- Preparing for SNR 1987A data:
  - Spring: 370 ks w/HETG (GTO)
  - Fall: 300 ks w/LETG (GO, McCray PI)
- Developing 3D modeling software
  - Hydra : <http://space.mit.edu/hydra>

Chandra  
Obsid 6345  
July 2005



HST optical images  
Jan.'03      Dec.'05



A simple model of SNR 1987A includes several components - each of which may emit X-rays: the expanding SN ejecta (**purple**), the dense "inner ring" with protrusions (**red**), the torus-like HII region around the ring (**green**), and an expanding blastwave out of the equatorial plane (**blue**).

The velocities of these components differ and will show up as Doppler shifts in the spectra.

