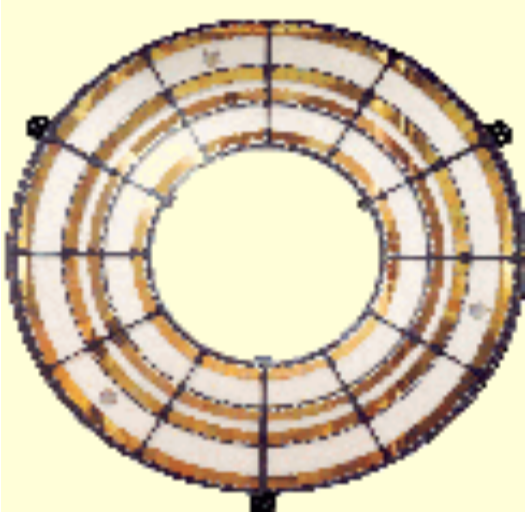
MIT Kavli Institute
for Astrophysics
and Space Research

Our new name!
(formerly CSR)



HETG - Status

Chandra Quarterly Review No. 18, May 24, 2005

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MIT Kavli Institute

Ongoing HETG Team Activities Summary

- HETG Performance and Calibration
  - 12 HETG obsids in January-April 2005 (1 GTO, 1 Cal)
  - Performance is Nominal
  - Monitoring HRMA FWHM - Capella obsid 5955 added.
  - HETG instrument paper (re)submitted to PASP:
    - http://space.mit.edu/home/dd/temp/Paper/ms.pdf

The *Chandra* High Energy Transmission Grating: Design, Fabrication, Ground Calibration and Five Years in Flight

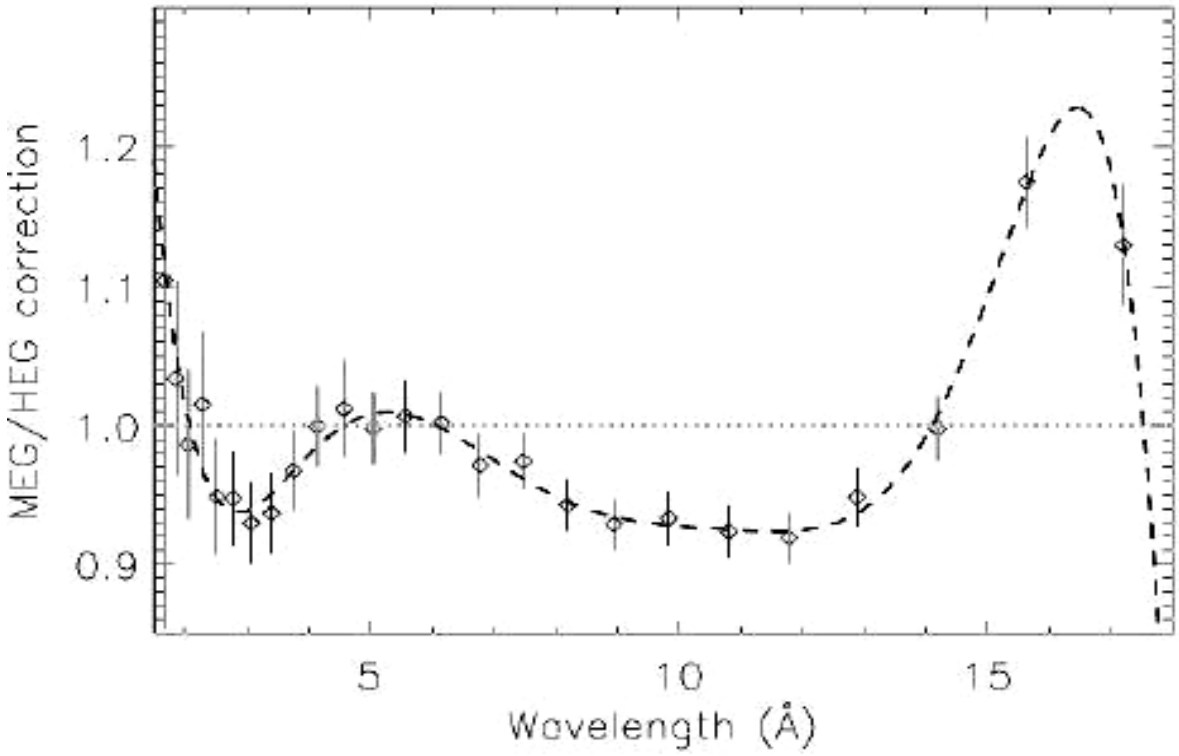
Claude R. Canizares, John E. Davis, Daniel Dewey, Kathryn A. Flanagan, Eugene B. Galton, David P. Huenemoerder, Kazunori Ishibashi, Thomas H. Markert, Herman L. Marshall, Michael McGuirk, Mark L. Schattenburg, Norbert S. Schulz, Henry I. Smith, Michael Wise

Ongoing HETG Team Activities, cont.

- HETG Performance and Calibration, cont.
  - Relative HEG/MEG efficiency calibrated, Marshall/CXC:
    - http://space.mit.edu/ASC/calib/heg_meg/

The precise cross-calibration of the MEG and HEG gratings has been determined by Herman Marshall CXC/MKI/Cal; shown in the plot at right.

In the range from 2Å to 15Å (~0.8 keV to 6 keV) *relative* corrections to the HEG and MEG efficiencies are small and smoothly varying.



Ongoing HETG Team Activities, cont.

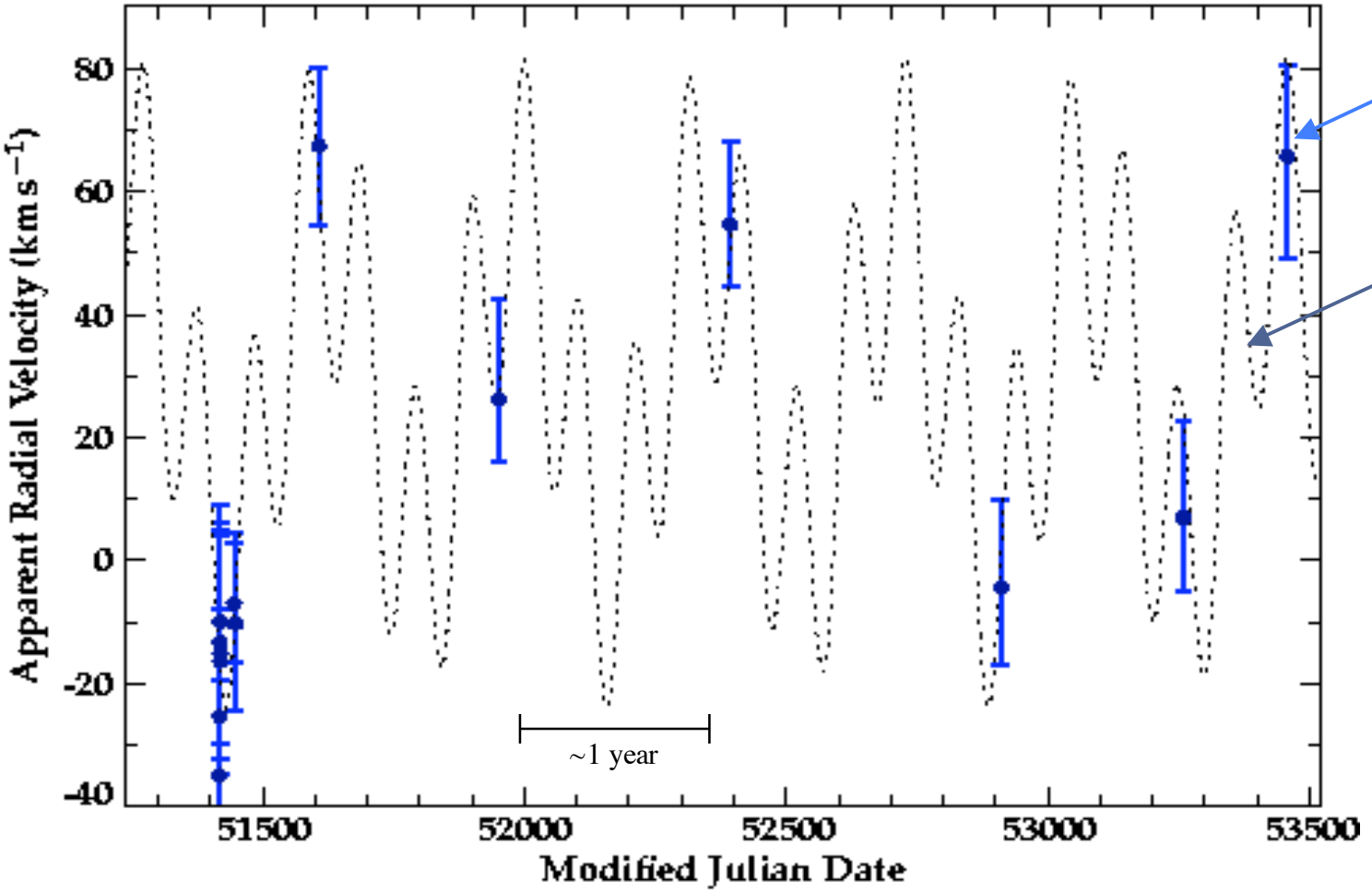
- Science Support to CXC, etc.
  - Contributed HETG article for Chandra Newsletter, Capella Doppler velocities in good agreement - **next slide**.

- GTO Science Program
  - GTO Targets selected/input for Cycle 7; two are "competed".
  - Post Docs: one leaving early; offer out to replacement.
  - HETG "Final Report" for NAS8-01129 submitted, Dec. 04:
    - http://space.mit.edu/HETG/Reports/final_followon.pdf

- HETG Science Examples:
  - Neon/Oxygen ratio in stars - **next slides**.
  - Cas A: velocities of discrete regions - **next slides**.

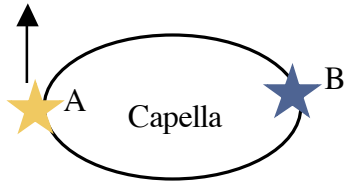
Capella Doppler Velocity w/HETG

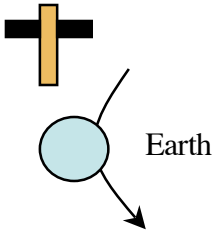
K. Ishibashi
CXC/MKI/SDS



New data point From Capella, Obsid 5955.

Expected velocity due to relative Capella A - Earth motion:



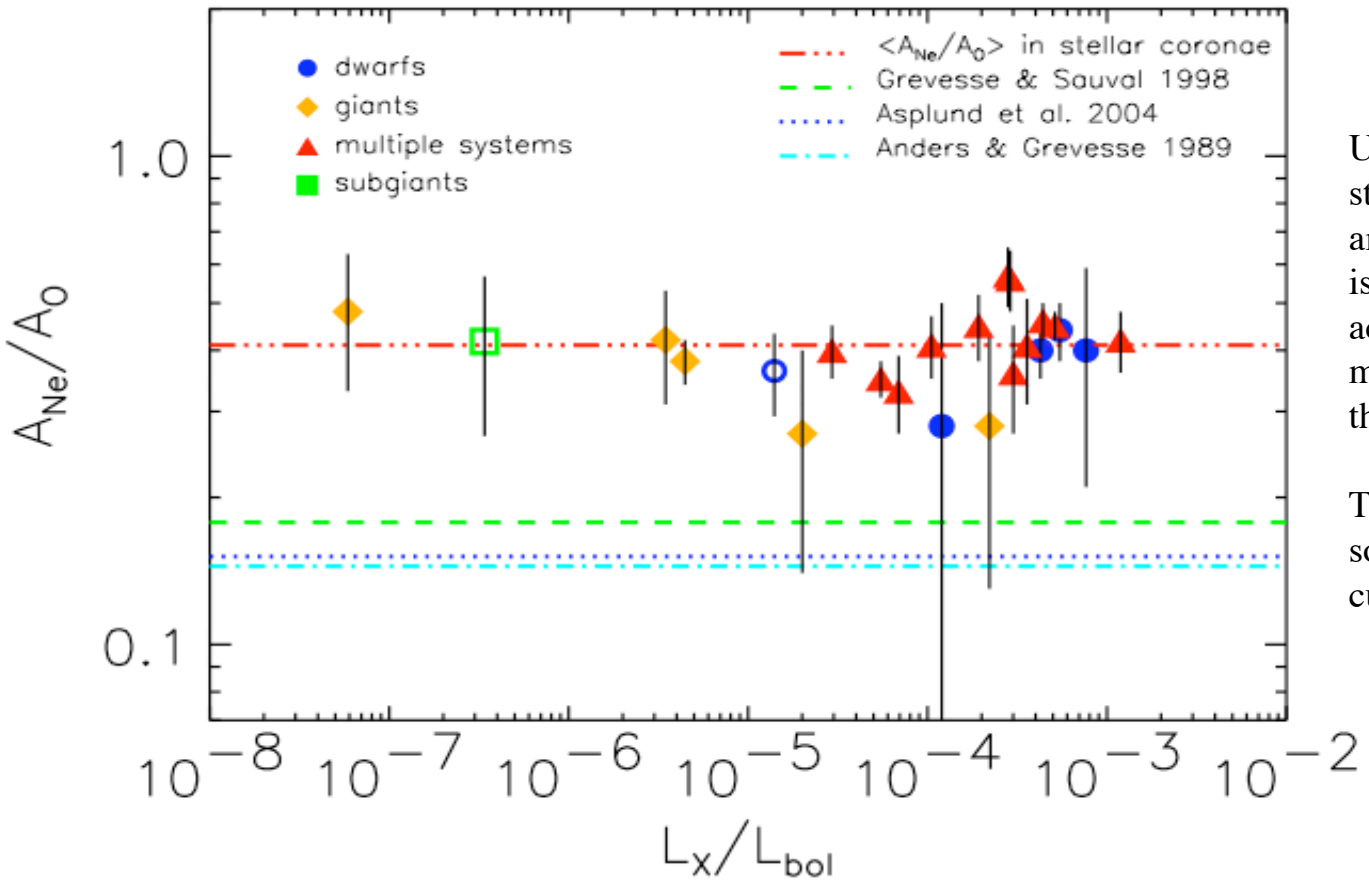


HETG Helps Solve a Solar Mystery

HETG Post Doc!

CfA →

Drake and Testa (2005), *Nature*, accepted.



"Activity level" of the star →

Using HETG spectra from over twenty stars, Drake and Testa show that the amount of Neon compared to Oxygen is very similar for all types and activity levels of stars. Further, their measured ratio is almost 3 times larger than has been generally assumed.

This revised Neon-to-Oxygen ratio solves a glaring discrepancy seen in current, precise models of our Sun.

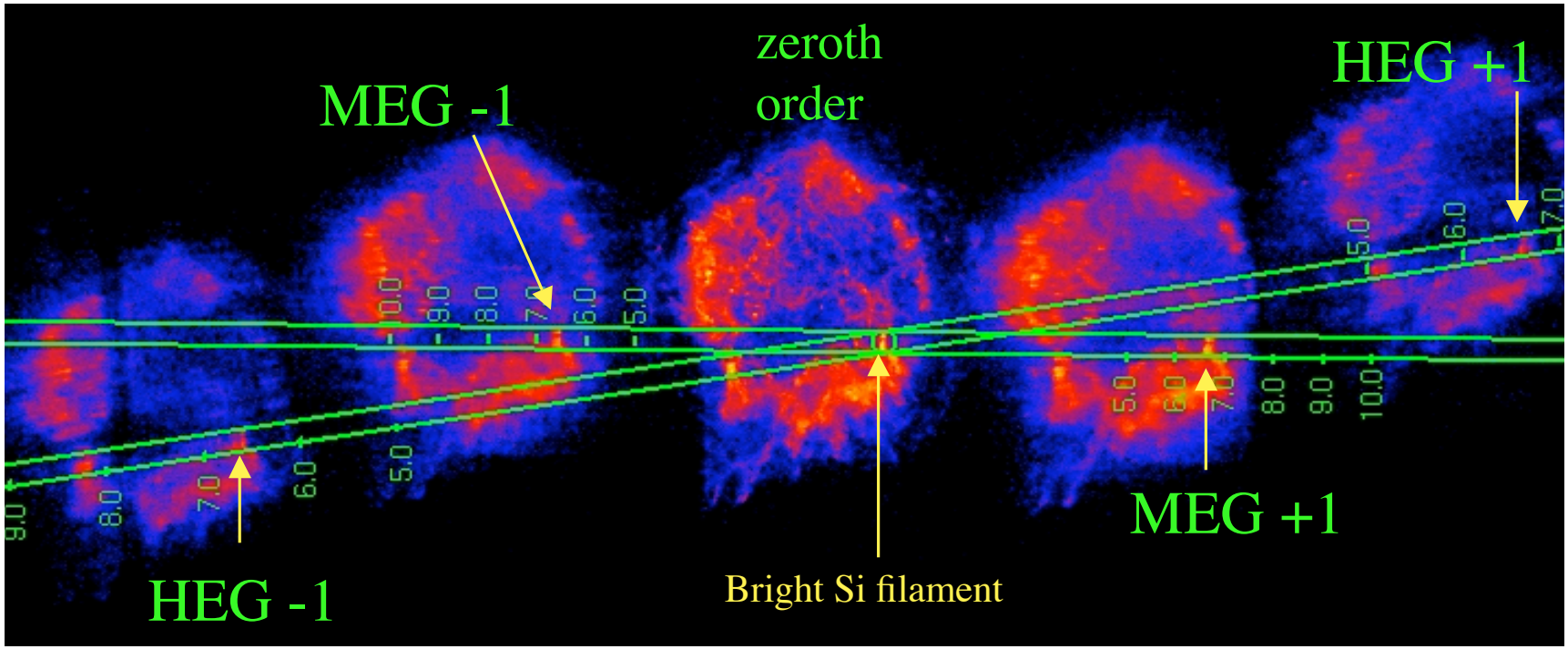
Cas A: Obsid 1046 w/HETG for 70ks

HETG Post Doc!

(Observed May 25th… 2001)

HETG/ACIS-S image filtered on Silicon energy range

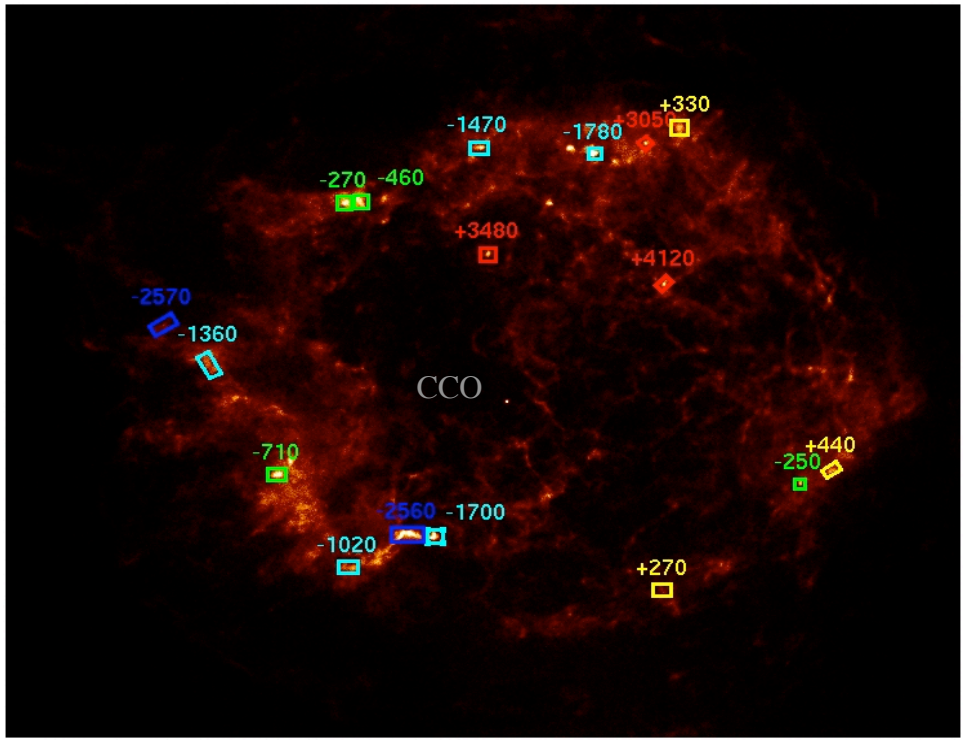
J. Lazendic



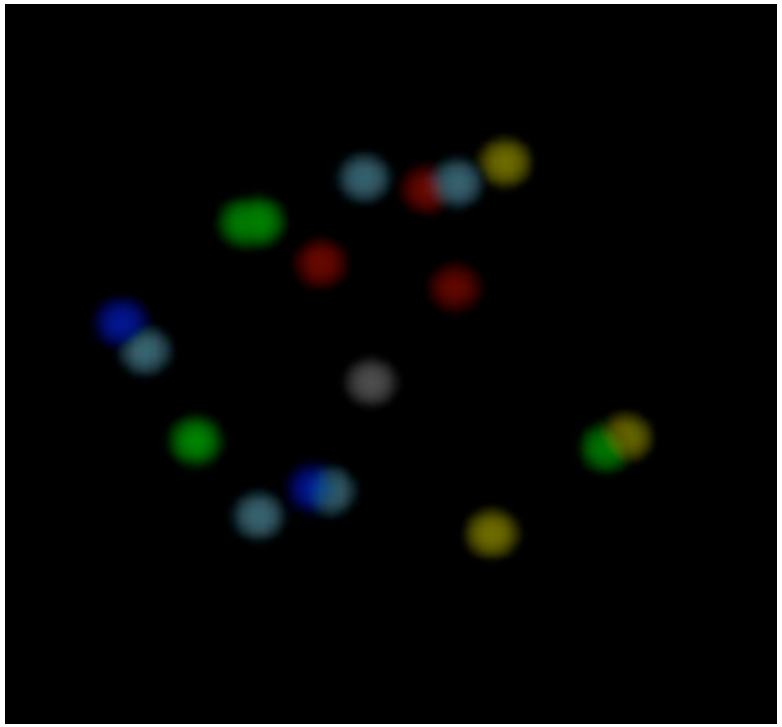
Silicon and sulfur lines can be measured at high resolution for bright, narrow features in the remnant.

Cas A: Velocity of Regions

HETG measured velocities of regions:



"Cartoon" model of regions in X,Y… and Z!



Velocity (km/s) color code

-2500 -1500 -500 +500 +3000

Velocity <---> 3rd dimension