



# Astrophysics Division Update

Presented to the

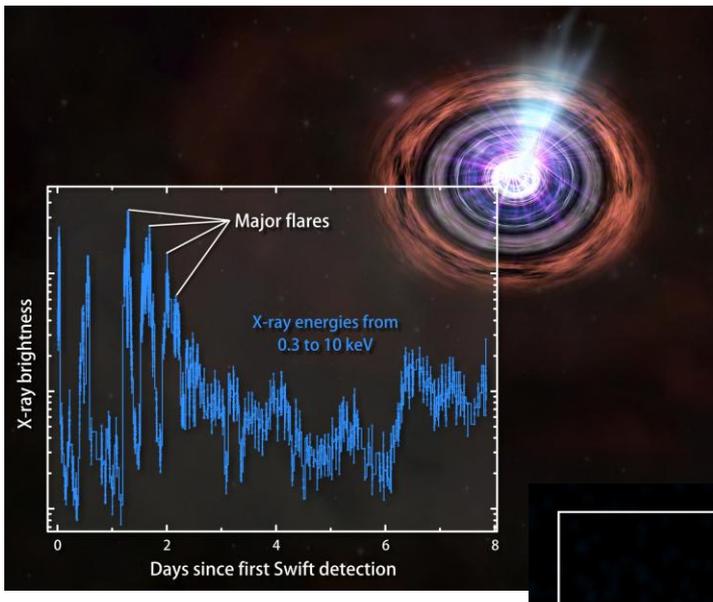
## Astrophysics Subcommittee of the NAC

**Dr. Jon Morse**

Director, Astrophysics Division  
Science Mission Directorate  
NASA Headquarters  
7 April 2011

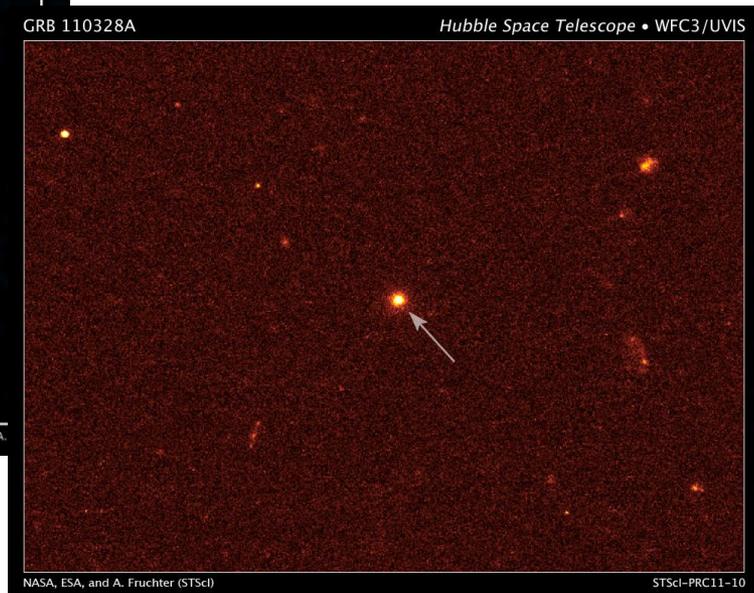
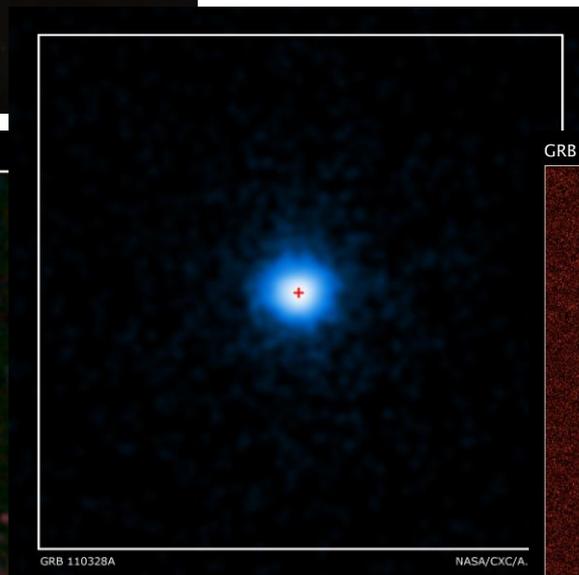
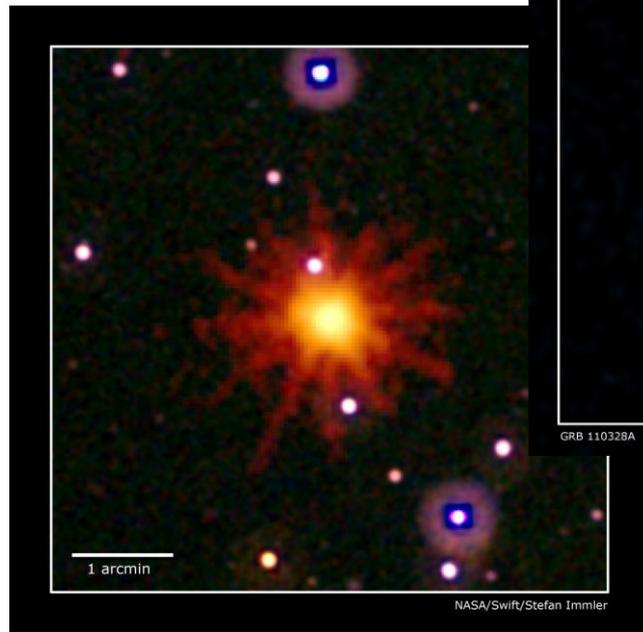


# NASA Telescopes Join Forces To Observe Unprecedented Explosion

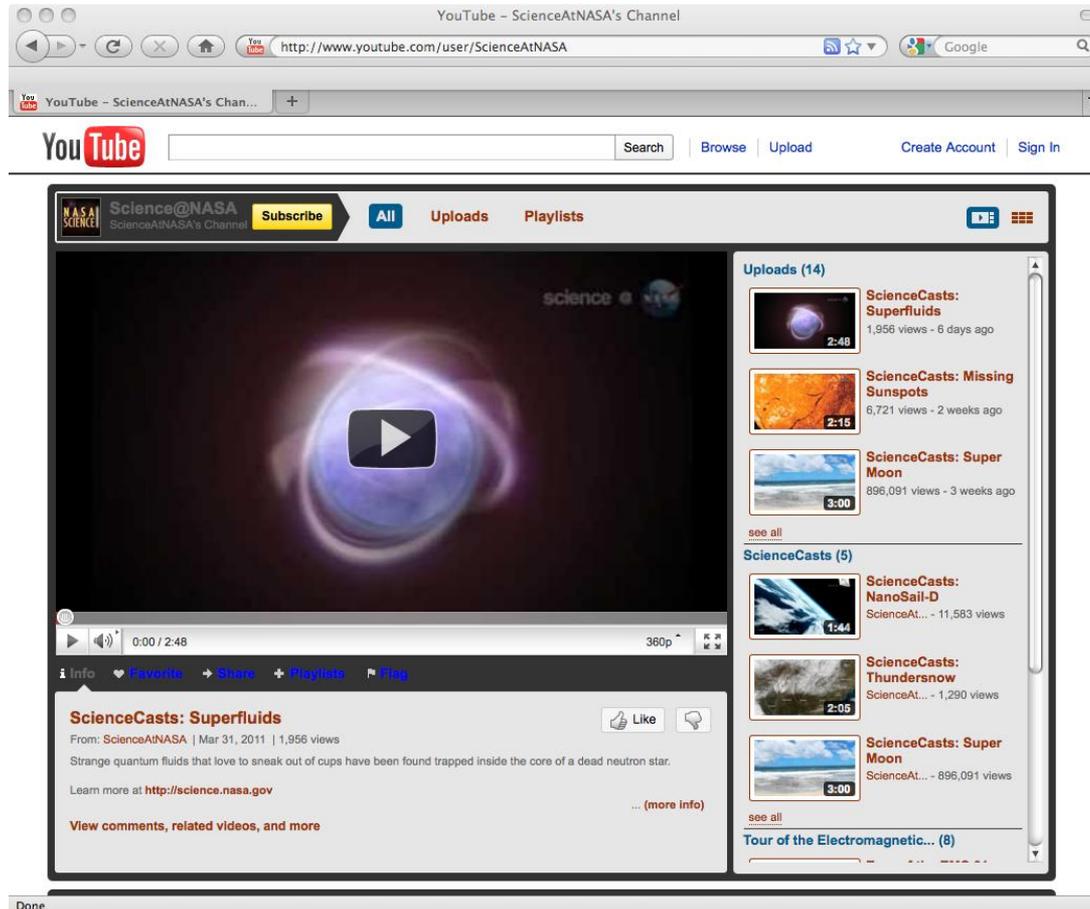


Discovered by Swift, followed up with Chandra and HST: very bright, variable, high-energy, long-lasting burst.

Most likely explanation is star being torn apart by galaxy's central black hole.

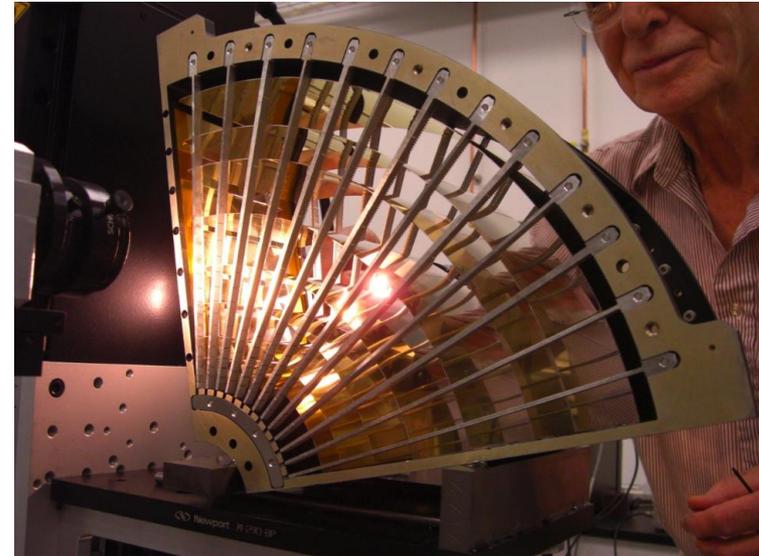


- SMD has a new YouTube channel hosting short science videos.
- The first Astrophysics ScienceCast was released March 31<sup>st</sup> on the recent Chandra Superfluid core.
- <http://www.youtube.com/user/ScienceAtNASA>

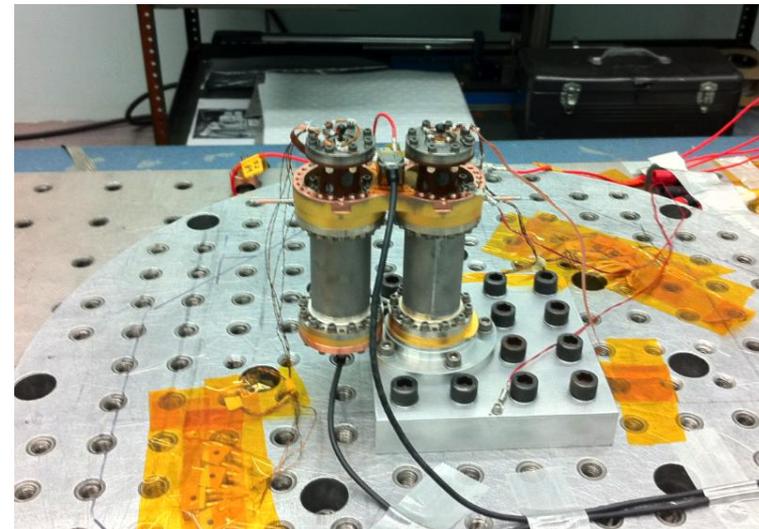


- The schedule for the current round of NASA Explorer proposals is:
  - Step 1 Selections announced (target) .....Sept 2011
  - Phase A Concept Study Reports due (target) ....August 2012
  - Down-selection for flight (target) .....February 2013
- There are:
  - 15 Astrophysics EX mission proposals - \$200M plus launch costs
  - 11 Astrophysics Missions of Opportunity proposals - \$55M includes both Partner MOs and Small Complete Missions
- Proposed ESA member state participation:
  - 7 (27%) have no ESA member state involvement
  - 15 (58%) involve science-only contributions from ESA member states
  - 4 (15%) involve ESA member state science contributions and in addition hardware or facility contributions valued at > \$10M

- Project working to maintain cost and schedule.
  - New Instrument Manager and financial team brought on board in March.
- Japanese Disaster has had modest impact to Astro-H thus far.
  - Delays in environmental testing for JAXA hardware due to black-outs and energy conservation efforts in Tokyo area.
  - JAXA has asked NASA to maintain our existing schedule and interfaces.
- Engineering Model (EM) Mirror nearing completion.
- EM model Adiabatic Demagnetization Refrigerator (ADR) has completed vibration testing and is ready for EM Integration and test.
- Design Meeting held at JAXA is 2/21-2/22.
- Science Working Group Meeting held at JAXA 2/23-2/24.
- Next Science Working Group Meeting at SLAC 7/18-7/19.
- NASA hardware Critical Design Review (CDR) to be held 6/21-6/23 at GSFC.



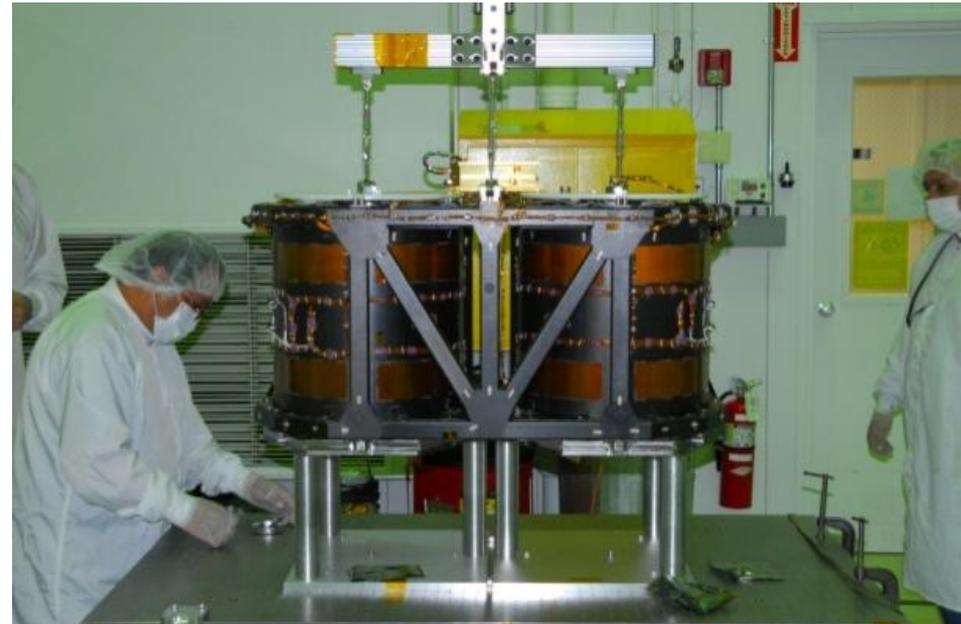
Assembly of the Astro-H EM mirror quadrant for the Soft X-ray Telescope



Astro-H EM ADR third and fourth heat switches during Y-axis vibrate

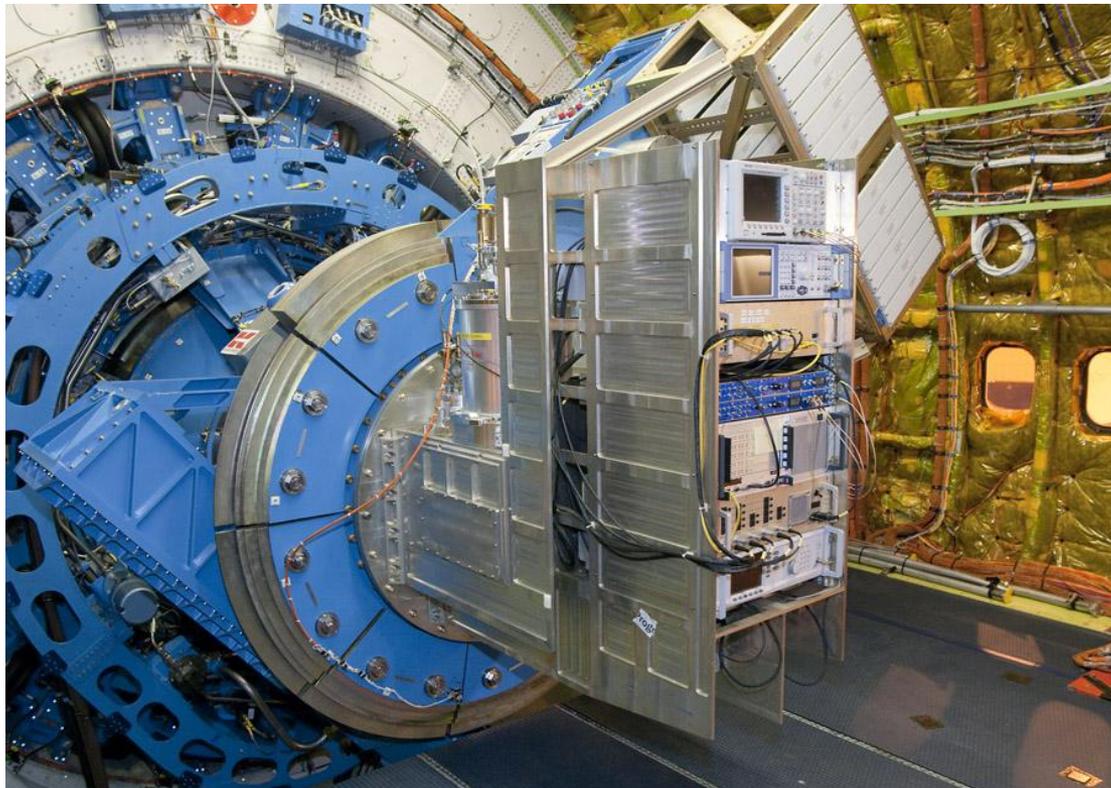
**NuSTAR Instrument Integration and Testing at JPL is currently ongoing, with Instrument completion planned for mid-late April 2011.**

- NuSTAR x-ray optics modules were both completed, installed into the Instrument structure, and aligned.**



**Overall NuSTAR Observatory completion currently planned for November 2011 to support a February 3, 2012 launch from Kwajalein Island**

- Initiated Short Science #2 Flight Series with German Receiver for Astronomy at Terahertz Frequencies (GREAT) on April 5 (see below)
- Obtained approval to fly the SOFIA aircraft in Reduced Vertical Separation Minimums (RVSM) airspace. This allows much greater flexibility in observations and broadens the range of science targets.
- Released Call for Proposals on March 1 for Airborne Astronomy Ambassadors (AAA) Pilot Program (limited distribution call)



# LISA and IXO

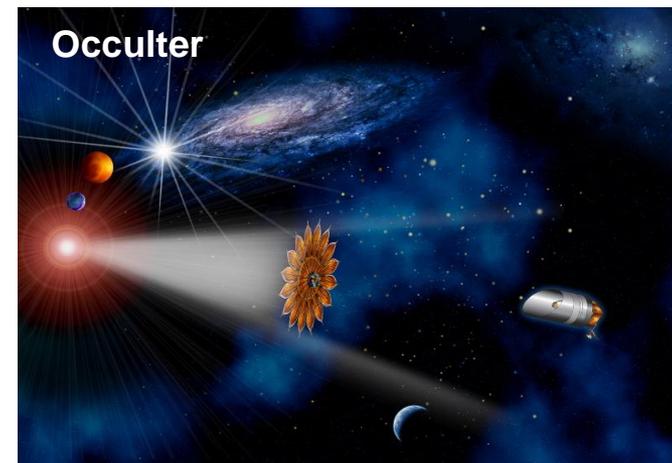
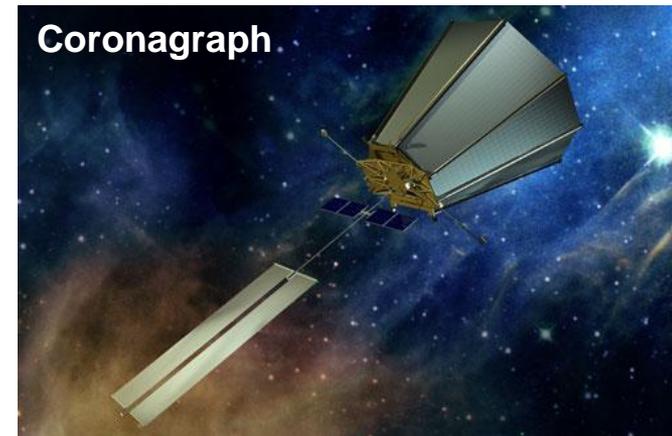
- 3 candidate concepts were competing for ESA's L1 2020 opportunity: LISA, IXO and EJSM/Laplace, each with a significant NASA partnership
- None of these were recommended as top priority by the US decadal surveys
- The decadal rankings combined with the constrained projected out-year resources in the FY12 President's Budget Request led ESA to conclude that a 2020 schedule is not feasible for any of the 3 candidates
- An exploratory ESA activity has started to see if any and which of the science goals of the three L missions could be implemented as an Europe-led mission targeting an early 2020's launch date
  - European "Science Teams" are being formed with rapid mission definition effort
  - A "NASA HQ-empowered scientist" will participate on each of the three Science Teams
  - L1 plan to be discussed at June ESA SPC meeting; tentative plan for downselect foreseen at Feb 2012 SPC meeting
- Consideration of the LISA and IXO concepts with the scale and partnerships as proposed to the NWNH decadal survey is ended
- NASA-APD plans to continue the base funding for the LISA and IXO teams through FY11 (pending not-larger-than-anticipated cuts in appropriations from Congress)
- NASA-APD will consult with the community about strategic investments in gravity wave and X-ray astrophysics in future years in the context of the NWNH recommendations and projected resource availability (after the JWST re-baseline is known)
  - APD will engage community through discussions and possible solicitations for new concept studies, in parallel with on-going interactions with ESA re-scoped L1 mission candidates

- Inflation Probe SAG (IPSAG) [Shaul Hanany coordinator]
  - Email sent out to community on March 10. So far have 37 members showing interest (28 US, 9 International). Expect more to join once activities begin.
  - Now gearing up for the first telecon; date TBA very soon.
- Technology SAG [Roger Brissenden coordinator]
  - Several telecons, many emails, to prepare inputs to NRC (see separate slides). Approximately a dozen participants.
- Updates/improvements to the website (thanks, PCOS office!)
- Face-to-face meeting now set
  - APS (American Physical Society) recently gave us a splinter meeting room in Anaheim for Sunday, 1 May, 9AM-2PM. Details to be posted on the website soon. Announcement email.

- NRC/NASA Technology Roadmapping Inputs
  - C. Martin attended TA08 Panel Workshop on 27 March 2011
  - Inputs from COPAG will be submitted in written form by 15 April 2011
  - #1: High quantum efficiency, low noise UV (& Optical-NIR) photon counting detectors
  - #2: UV coating developments and other technologies that make possible a joint UV/optical and Exoplanet Imaging mission
  - FIR/Sub-mm inputs coordinated by P. Goldsmith
  - WFIRST inputs also being discussed
- SAG2-Joint UVO-ExoP Mission: Coordination Meeting
  - Initial coordination meeting between COPAG and ExoPAG will occur on 26 April 2011 at StScl.
- Website on-line shortly
- Next community meeting
  - AAS meeting – Boston, Tuesday, May 24, 12:30 PM - 3:30 PM



- The ExoPAG is starting to lay the groundwork for a future, flagship-class, UV/optical telescope mission that could find and characterize Earth-sized planets around nearby stars
- COPAG is also interested in a large UV/optical telescope mission
- The ExoPAG and COPAG are holding a joint meeting on Apr. 26, 2011, at Space Telescope Institute in Baltimore to begin discussions on this mission
  - To find Earths, the telescope must be able to block out the light from the star and find dim planets close to it
  - A key question is whether this will be done using an internal coronagraph or an external occulter



# International planning

- Looking at options for instrument concept studies for contributions to international missions (e.g. M3, L1, SPICA)
- How to plan strategic coordination and cooperation
  - Working with other space agencies with similar goals and interests (e.g., ESA Cosmic Vision process, etc.)
- Considering possible 2012 conference...

# Backup Slides

- FY 2011 Budget completion
- JWST re-baseline
- Usage of advisory structure
- Future implementation of WFIRST, LISA, IXO; SPICA
- ST-7 timeliness
- FY12 budget reduction ramifications (GALEX, Suzaku,...)