

## "15 Years of Science with *Chandra*" Symposium

Dan Schwartz and Aneta Siemiginowska

July 23, 2014 marked the 15 year anniversary of the launch of the *Chandra* X-ray Observatory. A Symposium was held in Boston Park Plaza on November 18-21, 2014 celebrating the key science results from the recent years of *Chandra* operations. Topics and themes emphasized the high-resolution imaging and spectroscopy which is only possible with *Chandra*, including theory and related data from other observatories.

The Symposium was attended by more than 150 scientists including 12 invited speakers: Victoria Kaspi, Jacco Vink, David Huenemoerder, Giuseppina Fabbiano, Antara Basu-Zych, Francesca Civano, Julie Hlavacek-Larrondo, Brad Benson, Giuseppina Micela, Rodolfo Montez, Daryl Haggard, and Jon Miller. Their excellent review talks together with the contributions from other participants spanned a broad range of science topics, from the sun to stars to distant galaxies, clusters of galaxies and quasars, underlying the importance of *Chandra* and its unprecedented high angular resolution mirrors. Posters remained up throughout the week, with dedicated breaks (with refreshments) encouraging lively interactions.

Paul Hertz commented on "The past, present and future role of X-ray astronomy at NASA" and provided information about the upcoming opportunities and the timeline for the 2020 Decadal Survey. Alexey Vikhlinin presented a concept for an X-ray Surveyor mission, SMART-X (<http://smart-x.cfa.harvard.edu/>), a high-throughput X-ray observatory with *Chandra*-like angular resolution which utilizes new technologies for adjustable, light-weight mirrors and a new generation of science instruments. SMART-X would be the true successor to *Chandra*, and could be realized in the 2020s. *Chandra* remains robust to any credible single point failure, with many new discoveries to come during the remaining 10+ years of expected lifetime.

The Symposium included a Special Session on future science with *Chandra* and discussion of the high priority science objectives identified by the Science Panels in the New World, New Horizons Decadal study. The panel discussion was led by the CXC Director Belinda Wilkes

and included the New World, New Horizon's panel chairs and members: Roger Chevalier, Daniel Wang, Meg Urry, David Weinberg, and Eric Feigelson. Each panelist gave a short presentation highlighting the topic of their Decadal panel. All agreed that the *Chandra* capabilities are unique and could support many of the key science goals identified in the Decadal study.

A Symposium highlight was a visit by the STS93 Crew: Eileen Collins, Cady Coleman, Steve Hawley, and Michel Tognini (Jeffrey Ashby was unable to attend). The crew described their experience with the *Chandra* launch, presented a movie taken 15 years ago during the preparation for and during the launch, and also discussed their current activities. We all had a chance to chat with them and take photos during a coffee break.

The 15<sup>th</sup> year of *Chandra* operation held another milestone for the *Chandra* X-ray Center. The CXC director Harvey Tananbaum retired in April 2014. During the session attended by the STS93 crew, Roger Brissenden acknowledged Harvey's retirement and thanked him for creating and directing AXAF and the *Chandra* X-ray Center. Harvey was the key scientist behind the *Chandra* X-ray Observatory and we all acknowledge his contribution to science and progress in the studies of the X-ray Universe.

The Symposium program, talks and posters are available on the web page: [http://cxc.cfa.harvard.edu/symposium\\_2014/](http://cxc.cfa.harvard.edu/symposium_2014/).

The Symposium was sponsored by the *Chandra* X-ray Observatory, NASA/MSFC, Northrop Grumman Corporation, NetApp Corporation, and Springer.



Fig. 1 — STS93 crew members answer questions from the audience during a panel discussion. From left to right: Michel Tognini, Cady Coleman (*Chandra* Mission Specialist), Steve Hawley and Eileen Collins (Commander).



Fig. 2 — Rapt audience during a talk at the Boston Park Plaza Hotel.



Fig. 3 — STS93 Commander Eileen Collins gives Former Chandra Director Harvey Tananbaum a Chandra launch checklist as a keepsake.



Fig. 4 — Victoria Kaspi delivers her invited talk on neutron stars.



Fig. 5 — Brian Williams shares the results of a successful Large Project in his talk titled “A Deep Chandra Observation of SN 1006.”



Fig. 5 — Conference attendees look at posters and mingle during a refreshment break.



Fig. 6 — Q. Daniel Wang gives his presentation on X-ray jets from B2224+65.