XMM-Newton: The Next Decade

Presentation for the XMM-Newton Scientific Workshop 2007

4th-6th June 2007

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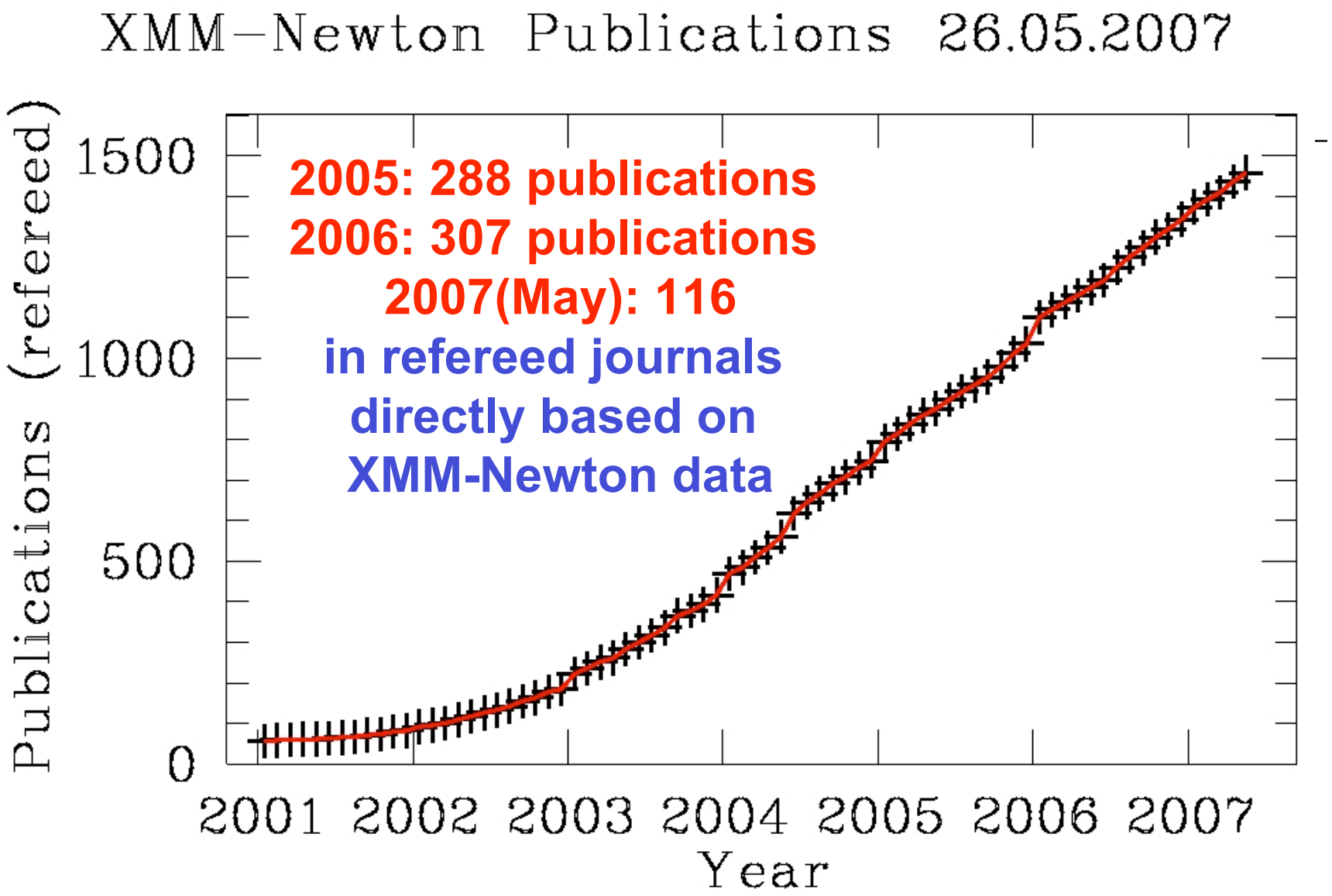
XMM-Newton: Users and Type of Mission

- **Users:**
  - Large Community: 1500 - 2000 scientists
  - All scientific topics are addressed
    - from comets and planets up to the most distant quasars
  - Majority of users are not directly connected with the XMM-Newton project

➔ **Observatory type mission:**
  - Annual call for observing time proposals (AOs)
  - Peer review process (OTAC)
  - Support for users: proposal preparation and submission, definition of observation details, enhancement, scheduling/coordination … help-desk, …analysis (SAS)…calibration …archiving (XSA)…

Requests and Usage

- **AO6 (closure Oct 2006):**
  - 594 valid proposals
  - Oversubscription 6.9
  - 425 different principal investigators from 29 countries
  - 1550 individual scientists
  - In total: 3500 scientists participated on XMM-Newton AOs
- **OTAC:**
  - 13 panels
  - 66 scientists (rotation every 2 AOs)
- **XSA:**
  - 2150 external registered users
  - 145 external users used the XSA in October 2006 (typical value)
  - 1700 data sets (ODF and PPS) were downloaded by external users (in October 2006)
- **SAS:**
  - Version 7.0 (public since 1st June 2006)
  - 1500 downloads
  - ~2000 scientists have access to SAS 7.0 (based on feedback to our questionnaire)


XMM−Newton Publications 26.05.2007
Publications (refereed)
1500
1000
500
0
2001 2002 2003 2004 2005 2006 2007
Year
2005: 288 publications
2006: 307 publications
2007(May): 116
in refereed journals
directly based on
XMM-Newton data

Citations I

Analysis of XMM-Newton papers (R. Smith, GSFC)

XMM-Newton Papers from	Top 1% Astro-physical Papers	Top 10% Astro-physical Papers
1 year ago:	7.8%	50%
2 years ago:	3.4%	37%
3 years ago:	1.9%	38%
4 years ago:	6.4%	35%
5 years ago:	7.4%	44%

Citations II

PUBLICATIONS OF THE ASTRONOMICAL SOCIETY OF THE PACIFIC, **118**: 651–655, 2006 April

…"

Productivity and Impact of Space-based Astronomical Facilities

VIRGINIA TRIMBLE,[1] PAUL ZAICH,[2] AND TAMMY BOSLER[3]
Received 2005 November 30; accepted 2006 January 4; published 2006 April 11

ABSTRACT. In 2001, 18 journals published about 1270 astronomical papers that reported and/or analyzed data gathered by space-based observatories and missions. These papers were cited 24,460 times in papers published in 2002–2004, an average of 19.26 citations per paper or 6.42 citations per paper per year (sometimes called

…" The result is superstar status in citation numbers for *XMM-Newton* (whose first-light package appeared in 2001) and in paper numbers for *Chandra* (launched 5 months earlier),

…"

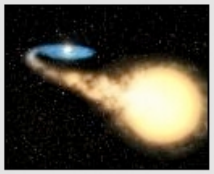
TABLE 3

PAPERS AND CITATIONS BY SATELLITE (ETC.)

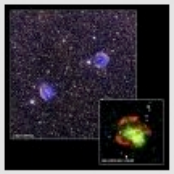
Facility	Period of Operation	Citations	Papers	C/P
	X-Ray			
XMM-Newton	1999 Dec–present	3622	83.5	43.4[a]
Chandra	1999 Jul–present	6092	175.8	34.6
ROSAT	1990 Jun–1999 Feb	2212	130.3	17.0
BeppoSAX	1996 Apr–2003 Apr	1196	81.2	14.7
ASCA	1993 Feb–2000 Jul	1553	111.5	13.9

Highlights 2007 (so far)

03-Jan-2007:
Black hole found inside globular star cluster
Astronomers have found a black hole where few thought they could ever exist, inside a globular star cluster. The finding has broad implications for the dynamics of stars clusters and also for the existence of a still-speculative new class of black holes called 'intermediate-mass' black holes.
Read further details on the **ESA News Pages**



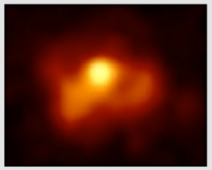
05-Jan-2007:
X-ray evidence supports possible new class of supernova
Evidence for a significant new class of supernova has been found with the European Space Agency's XMM-Newton and NASA's Chandra X-ray Observatory. These results strengthen the case for a population of stars that evolve rapidly and are destroyed by thermonuclear explosions.
Read further details on the **ESA News Pages**



07-Jan-2007:
First 3D map of the Universe's dark matter scaffolding
An international team of scientists has assembled a three-dimensional map that offers a first look at the web-like large-scale distribution of dark matter in the Universe.
Read further details on the **ESA News Pages**

06-Feb-2007:
Universe contains more calcium than expected
The universe contains one and a half times more calcium than previously assumed. This conclusion has been drawn by astronomers using XMM-Newton observations.
Read further details on the **ESA News Pages**

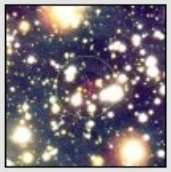
16-Feb-2007:
First X-ray detection of a colliding-wind binary beyond the Milky Way
Imagine two stars with winds so powerful that they eject an Earth's worth of material roughly once every month and imagine those two winds colliding head-on. Astronomers have conclusively identified the X-rays from about two-dozen of these systems in our Milky Way, but they have never seen one outside our galaxy. Until now.
Read further details on the **ESA News Pages**



22-Feb-2007:
XMM-Newton reveals a magnetic surprise
XMM-Newton has revealed evidence for a magnetic field in space where astronomers never expected to find one. The magnetic field surrounds a young star called AB Aurigae and provides a possible solution to a twenty-year-old puzzle.
Read further details on the **ESA News Pages**

23-Feb-2007:
Anniversary view of nearest detected supernova
Twenty years after the first detection of SN 1987A, the nearest supernova ever detected so far, XMM-Newton provided a fresh-new view of this object. XMM-Newton confirms taht the source keeps brightening.
Read further details on the **ESA News Pages**

09-Mar-2007:
XMM-Newton solves Decade Long Mystery
The brightest member of the so-called 'Magnificent Seven' has been found to pulsate with a period of seven seconds. This discovery casts some doubt on the recent interpretation that this object is a highly exotic celestial object known as a quark star.
Read further details on the **ESA News Pages**



Highlights 2007 (so far)

04-Apr-2007:
XMM-Newton catches Magnetar in Giant Hiccup
Astrophysicists have managed to catch a recently discovered magnetar in a sort of giant cosmic hiccup that still has them puzzled.
Read further details on the **ESA News Pages**

10-Apr-2007:
45-year old mystery spiral arms explained?
Astronomers may have cracked a 45-year old mystery surrounding two ghostly spiral arms in the galaxy M106 (NGC 4258).

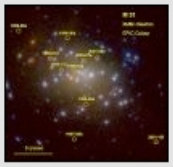
Read further details on the **ESA News Pages**

20-Apr-2007:
XMM-Newton pinpoints intergalactic polluters
Warm gas escaping from the clutches of enormous black holes could be the key to a form of intergalactic 'pollution' that made life possible, according to new results from XMM-Newton.

Read further details on the **ESA News Pages**

9-May-2007:
X-rays provide new way to investigate exploding stars
XMM-Newton has revealed a new class of exploding stars - where the X-ray emission 'lives fast and dies young'.

Read further details on the **ESA Space Science News Pages**

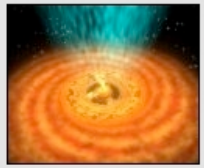


16-May-2007:
New technique for 'weighing' black holes
XMM-Newton has helped to find evidence for the existence of controversial Intermediate Mass Black Holes.

Read further details on the **ESA News Pages**

31-May-2007:
X-rays from gas streams around young stars revealed
XMM-Newton has surveyed nearly two hundred stars under formation to reveal, contrary to expectations, how streams of matter fall onto the young starsã€™ magnetic atmospheres and radiate X-rays.

Read further details on the **ESA News Pages**



Please contact (Norbert.Schartel@sciops.esa.int) or the XMM-Newton Helpdesk

XMM-Newton: The Next Decade

- **Background for Workshop: XMM-Newton Users Group Extra-ordinary Meeting (9 January 2007)**
  - **➔ Resolution (http:/ /xmm.esac.esa.int/)**
  - **➔ Extensions are not any longer automatically granted**
  - **➔ Costs**
  - **➔ Title of Workshop**

- **Scientific Workshop:**
  - **scientific reasons and requirements for extensions**
  - **125 participants**
  - **WS ➔ conference**
  - **schedule is extremely tight**

XMM-Newton: The Next Decade

- **The WS should address three questions:**
  1. **Are there scientific reasons to extend XMM-Newton mission to 2010-2012?**
     - **Herschel & Planck follow-up,..**
  2. **Are there scientific reasons to extend XMM-Newton beyond 2012?**
     - **Open fundamental questions, new science topics, long term value, ...**
  3. **Are there new observing strategies, modes, analysis tools, or calibration issues important for the future of XMM-Newton?**

– **Time vs. ideal scientific case**

Proceedings

1. **Presentations will be put online at http://xmm.esac.esa.int/**

2. **2nd issue of Astronomical Notes in 2008**
   - **Page limit of 120 pages**
   - **Minimum number of pages per article 4**
   - **Referees for papers will be needed**

   ➔ **Presenters of Review Talks and Solicited Talks will be contacted**