

# ESA Announcements of Opportunity Outcome Analysis

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European Space Agency



# The ESA Fleet for Astrophysics



## → COSMIC OBSERVERS

CONCEPTS



spica



theseus

IN DEVELOPMENT



webb  
(2021)



ariel  
(2028)



euclid  
(2022)



cheops  
(2019)



plato  
(2026)



xrism  
(2021)



einstein  
probe  
(2022)



athena  
(2031)



lisa  
(2034)

OPERATIONAL



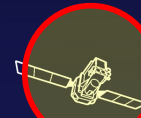
hubble  
(1990-)



gaia  
(2013-)



xmm-  
newton  
(1999-)



integral  
(2002-)

microwaves

sub-millimetre

infrared

optical

ultraviolet

x-rays

gamma rays

gravitational  
waves

LEGACY



planck  
(2009-2013)



herschel  
(2009-2013)



iso  
(1995-1998)



akari  
(2006-2011)



hipparcos  
(1989-1993)



corot  
(2006-2014)



iue  
(1978-1996)



exosat  
(1983-1986)



hitomi  
(2016)



suzaku  
(2005-2015)



cos-b  
(1975-1982)



lisa pathfinder  
(2015-2017)



microscope  
(2016-2018)

#Space19plus

Space19



## ESA Announcement of Observing Opportunities



- Observing time AOs are normally only used for ESA's observatory missions – the targets/observing strategies for the other missions are generally the responsibility of the Science Teams.
- ESA does not provide funding to successful proposers.
- Results for ESA-led missions with recent AOs presented:
  - XMM-Newton
  - INTEGRAL
  - Herschel
- Gender information was not requested in the AOs. It has been “manually” derived by the project scientists and SOC staff.

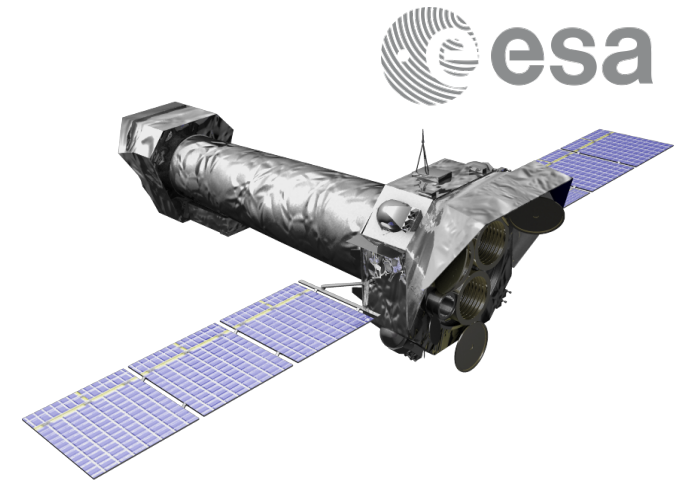


# XMM-Newton – ESA's Large X-ray Observatory



## XMM-Newton

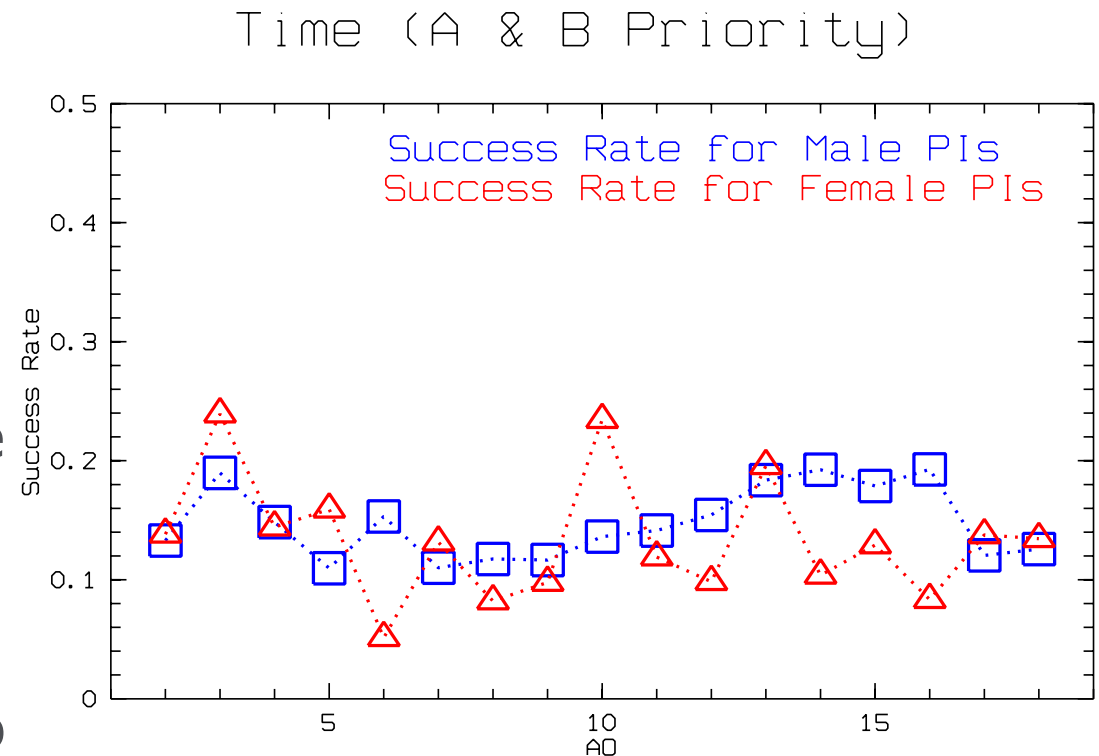
- ESA's second X-ray observatory. Launched in 1999 with annual calls for observing proposals. Operational.
- Typically 500 proposals per XMM-Newton Call with an over-subscription in observing time of 5-7. Total of 9233 proposals.
- The TAC typically consists of 70 scientists divided into 13 panels with an overall TAC chair.
- Output is >6000 refereed papers in total, >300 per year





## XMM-Newton – AO Success Rates

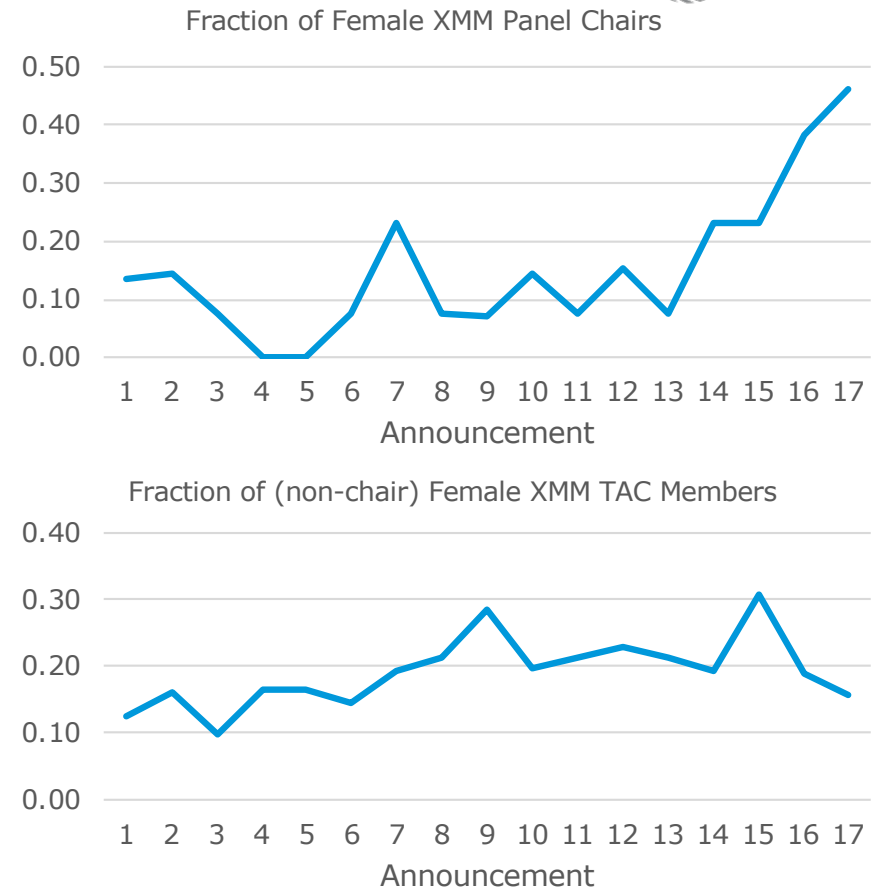
- Plot shows male and female observing time success rates for A+B pri targets
- **24%** of requested XMM-Newton observing time had a female PI
- The mean male success rate is **0.147**, the mean female success rate is **0.134**
- No large difference between gender success rates and no obvious evolution with time





# XMM-Newton – TAC Composition

- One female overall TAC chair out of five
- 15% female panel chairs (out of 226)
- 19% female TAC members out of the 700 total (excluding chairs)
- Evidence for increasing female participation in leadership positions as panel chairs in last ~5 years





## EXOSAT - Comparison



- EXOSAT was ESA's first X-ray observatory which operated between 1983 and 1986.
- Four observing AO's - 17 paper copies to be delivered to ESTEC! Detailed information no longer available.
- Alternatively, the gender distribution of the first authors of the refereed publications has been "manually" evaluated:
  - 740 EXOSAT papers with the majority appearing in 1985-1990
  - 65 female first authors, or **9%** of the total
- Provides a indication of the gender balance of the high-energy community 30 years ago.





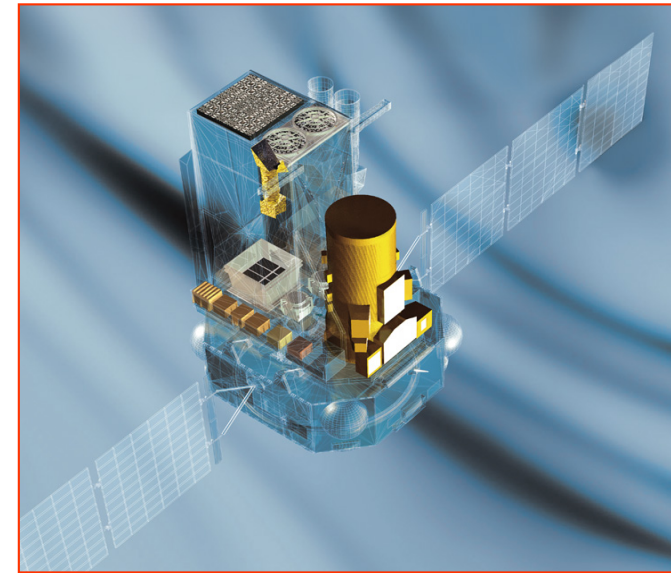
# INTEGRAL - ESA's Gamma-ray Observatory



# INTEGRAL



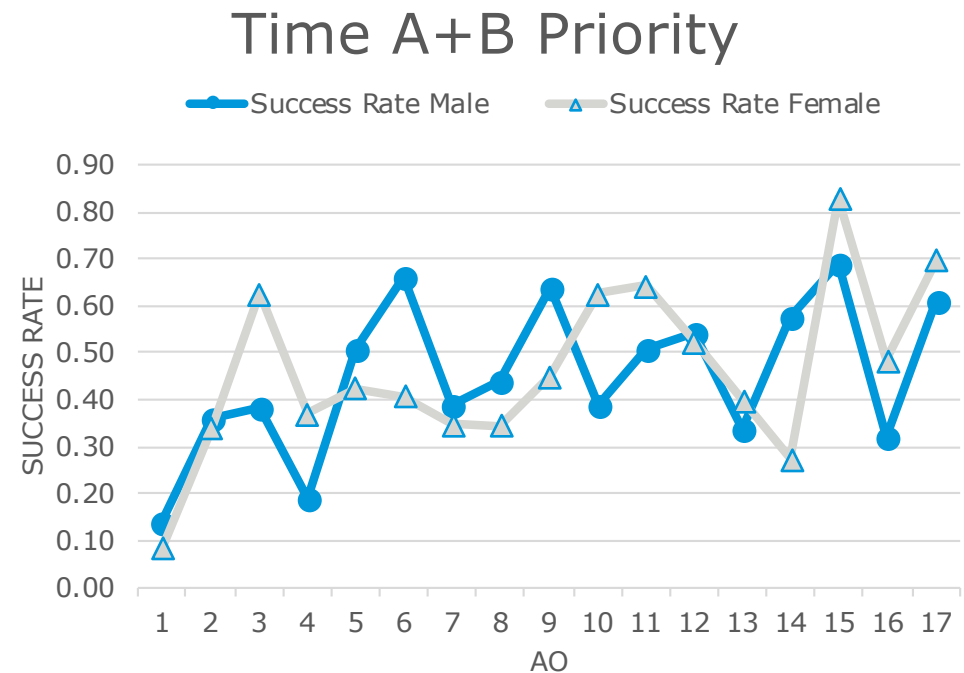
- Launched in 2002 with annual calls for observing proposals. Operational.
- 25% of observing time reserved for the Russian community – provision of Proton launch vehicle.
- Typically 60 proposals per call with an over-subscription in observing time of 3-5. Total of 1879 proposals.
- TAC typically consists of 15-25 scientists divided into 3 or 4 panels.
- Output is a total of >1600 refereed papers, ~80 per year





## INTEGRAL – AO Success Rates

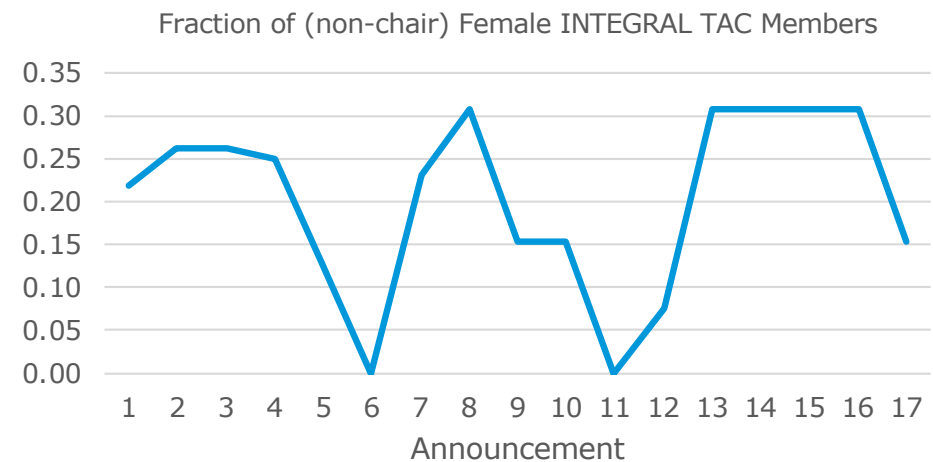
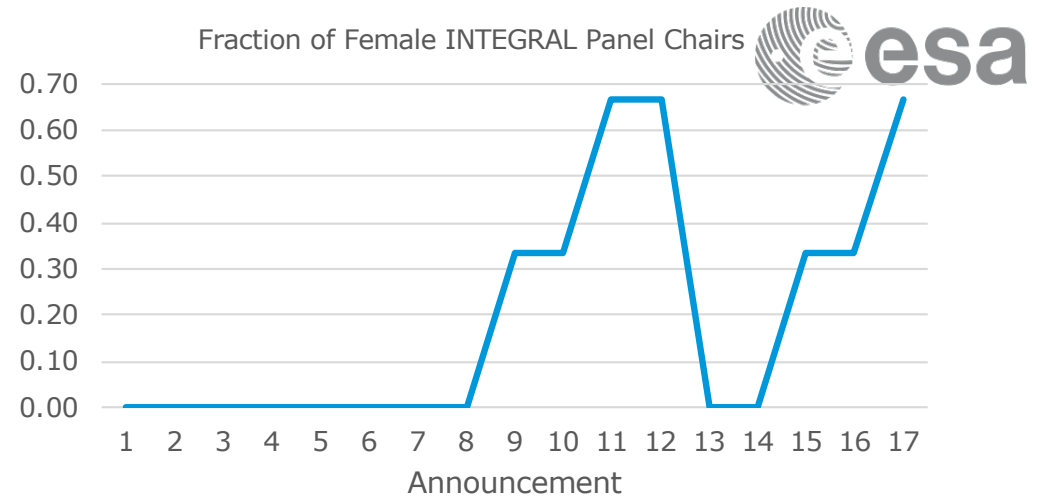
- Plot shows male and female observing time success rates for A+B pri targets
- **18%** of approved INTEGRAL observing time has a female PI
- The mean male success rate is **0.453**, the mean female success rate is **0.462**
- No large difference between gender success rates and no obvious evolution with time





## INTEGRAL – TAC Composition

- Much smaller TACs than for XMM-Newton – lower number of proposals
- 19% female panel chairs (out of 53)
- 20% female TAC members out of the 208 total (excluding chairs)
- Evidence for increasing female participation in leadership positions as panel chairs





# Herschel - ESA's sub-mm/IR large observatory



# Herschel



- ESA's second IR Space Observatory. Operational from May 2009 to April 2013.
- Two AOs for GO. 600 proposals per call with an oversubscription in time of  $\sim 3$ .
- TACs of around 40 people were organized into 9 panels. TAC overall chair was female, as were 29% of panel members and 25% of panel chairs.
- >2500 refereed papers in total, currently 250 per year.





- A total of 1108 proposals were submitted to the two Open Time AOs. 776 with male lead proposers, 332 with females (30%).
- Of these, 434 male-led and 180 female-led proposals were awarded observing time. This gives success rates of **0.559** for male-led proposals and **0.542** for female-led ones.



# ISO - Comparison



- ESA's first IR space observatory. Operational from November 1995 to May 1998
- Approximately 2000 refereed papers
- 45% of the ISO observing time was reserved for GT, the rest was assigned in two AOs. Oversubscription of  $\sim 4$  in time
- Information only on the 1079 successful proposals.
- Of these 162, or **15.0%** had female PIs compared to 29% for Herschel (2009-2013)





# Looking Forward



## Voyage 2050 – The Future Programme



- The successor to Cosmic Vision – defining the Science Programme between 2035 and 2050.
- Senior Committee appointed with two co-chairs.
- Community has submitted 96 “White Papers” on science topics of interest for the 2035 timeframe.
- Topical Teams will help evaluate the White Papers, supporting the Senior Committee. Topical Team members can be self nominated.



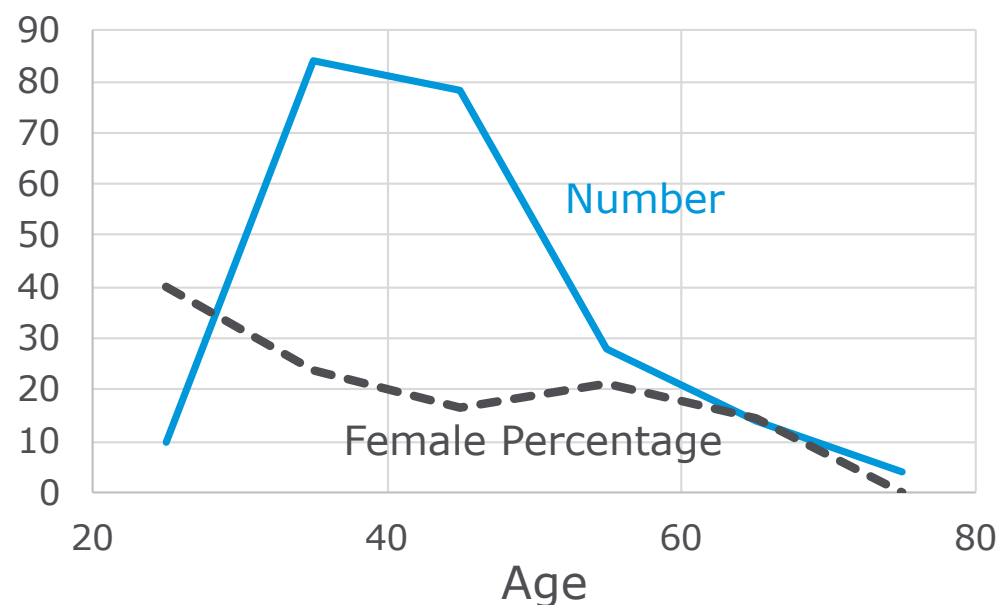
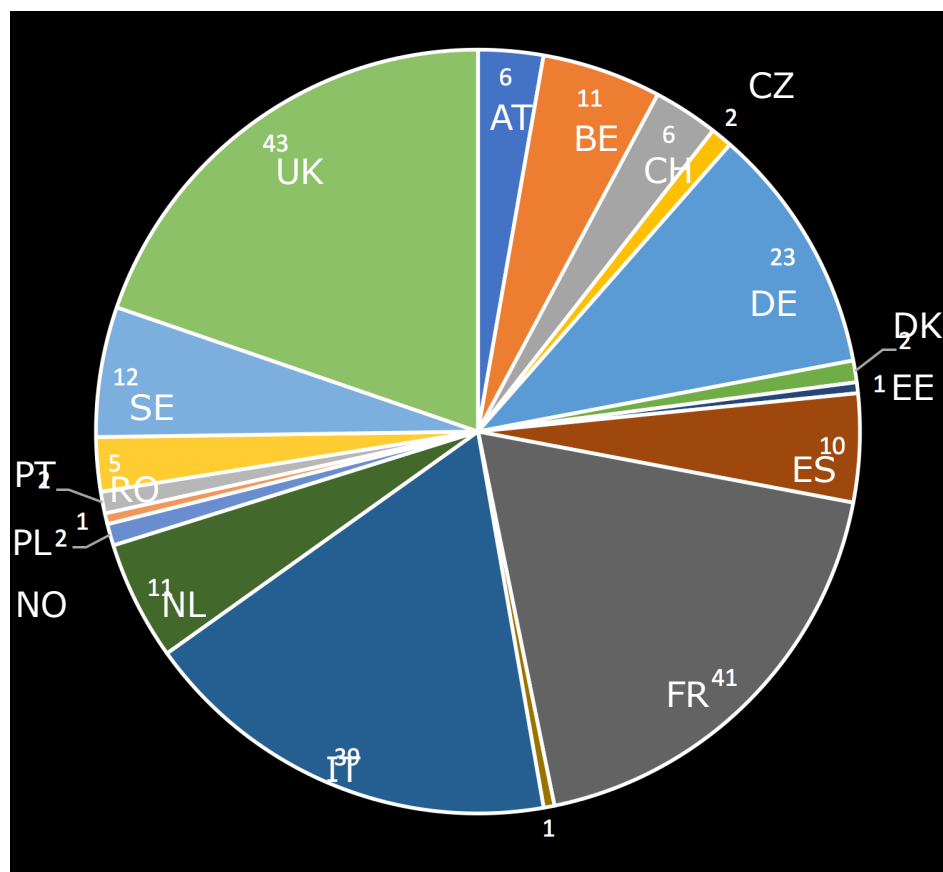
Linda Tacconi



Chris Arridge



# Voyage 2050 Topical Team Applications (218)



Decreasing percentage of female applications with age. ~20% at peak number between 30-50 years.



# Summary and Conclusions



# Summary



Mission	No. Proposals	Female Participation	Female Success Rate	Male Success Rate	Ratio
XMM-Newton	9233	24%	0.134	0.147	0.91
INTEGRAL	1879	18%	0.462	0.453	1.02
Herschel	1108	27%	0.542	0.559	0.97



# Conclusions



1. The analysis of the AO selections for the missions examined does not show any strong gender bias.
2. An increasing participation of female scientists in ESA's missions with time and particularly in leadership positions on ESA TACs is evident.
3. There is no strong reason to move to double blind proposal reviews for ESA missions.
4. Requesting relevant proposer information in future AOs may allow a more reliable evaluation of the evaluation process.