

**Riccardo Giacconi**  
**Personal memories**  
**Impact on the future of Astronomy**



# How I met Giacconi 1972



# How I met Giacconi Palermo/Erice 1972



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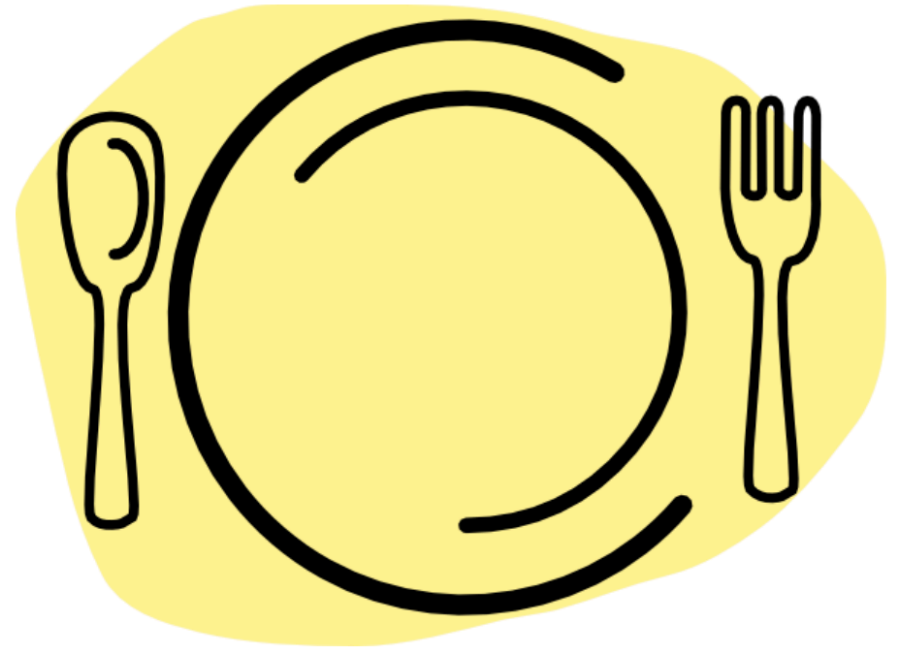


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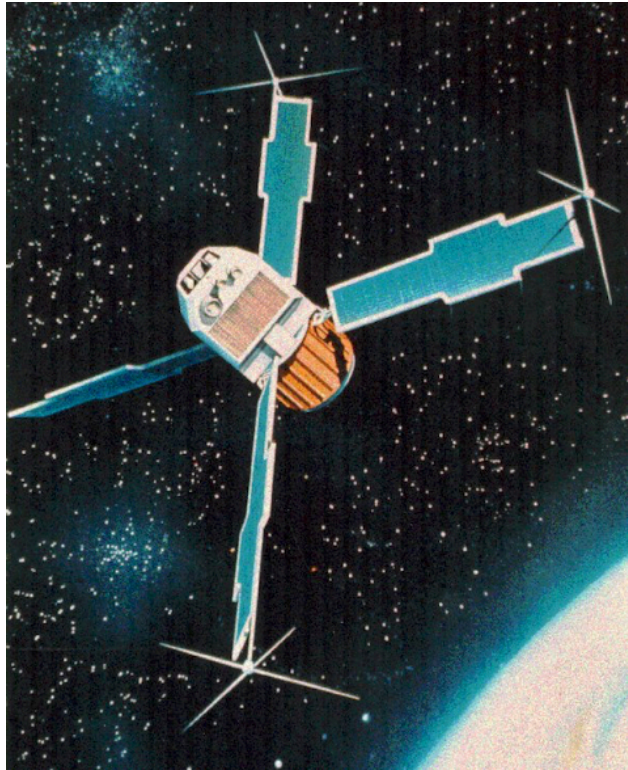
Giacconi Symposium 2019

CENTER FOR **ASTROPHYSICS**  
HARVARD & SMITHSONIAN

# How I met Giacconi Palermo/Erice 1972



# At AS&E and SAO a challenging and encouraging presence



# **Riccardo Giacconi** **and the Cultural Revolution in Astronomy**

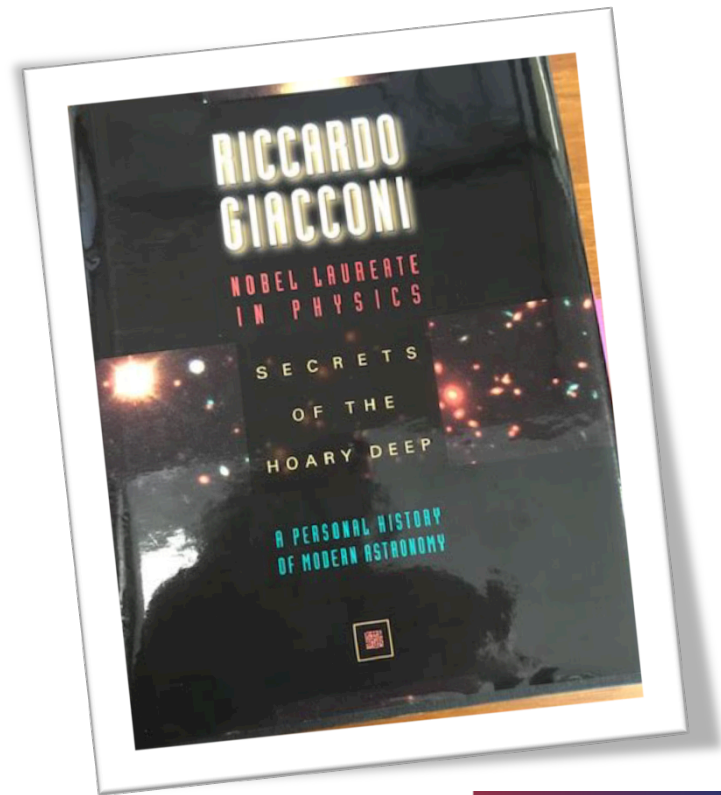
X-ray astronomy is not his only achievement



# Riccardo Giacconi and the Cultural Revolution in Astronomy

X-ray astronomy is not his only achievement

Giacconi fostered the tools and the culture of modern astronomy, centered on large observatory facilities serving the astronomical community.



# Riccardo Giacconi and the Cultural Revolution in Astronomy

## A 'business model' for astronomy teams

- Scientific leadership and management
- Integrated science-technical teams, with scientists doing **both functional work and research**

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## A 'business model' for astronomy teams

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....when I got my SAO job,  
Riccardo made it very clear

# Riccardo Giacconi and the Cultural Revolution in Astronomy

## End-to-end vision of astronomy projects

- Realized the importance of catering to the entire observatory lifecycle
- From conception, through hardware implementation and operations
- Including calibrations, software pipelines, data archives, and software user tools.

# Riccardo Giacconi and the Cultural Revolution in Astronomy

## Data Centers

- Opened up a PI space observatory to general use by the community
  - Einstein Observatory Guest Observer Program
  - **People were very nervous at the time....**
- Fostered community use of major observatories and their data products
  - STScI, ESO, AUI (ALMA)

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## Data Centers

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- Fostered community use of major observatories and their data products
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- **This wider observational approach has contributed greatly to a better understanding of the universe and its evolution.**

# Riccardo Giacconi and the Cultural Revolution in Astronomy

## Data beyond the end of the project

- Fostered the establishment of calibrated data archives
  - First developed for the Einstein X-ray Observatory at the Center for Astrophysics, calibrated archives are now implemented by NASA and ESO
  - Considered for the new generation of large US ground-based observatories

# **Riccardo Giacconi** **and the Cultural Revolution in Astronomy**

## **Data beyond the end of the project**

- **Fostered the establishment of calibrated data archives**
  - **First developed for the Einstein X-ray Observatory at the Center for Astrophysics, calibrated archives are now implemented by NASA and ESO**
  - **Considered for the new generation of large US ground-based observatories**
  - **More astronomers are embracing the use of multi-wavelength observations, from radio to X-rays**

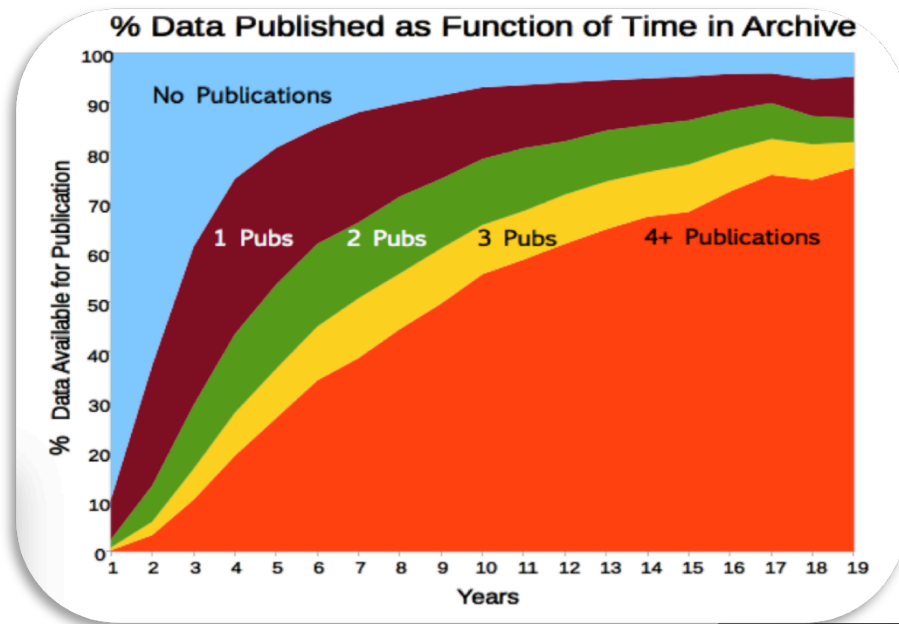


# Riccardo Giacconi and the Cultural Revolution in Astronomy

## Data beyond the end of the project

- Archival data get re-used, increasing their discovery potential with time

Chandra Data



# Riccardo Giacconi and the Cultural Revolution in Astronomy

## Data beyond the end of the project

- The adoption of data interoperability standards for astronomy is a result of this philosophy
- Developed by the International Virtual Observatory Alliance
- Used in major data centers worldwide, most recently Gaia, LSST, .



# Riccardo Giacconi

## Mentor, Friend, Innovator

