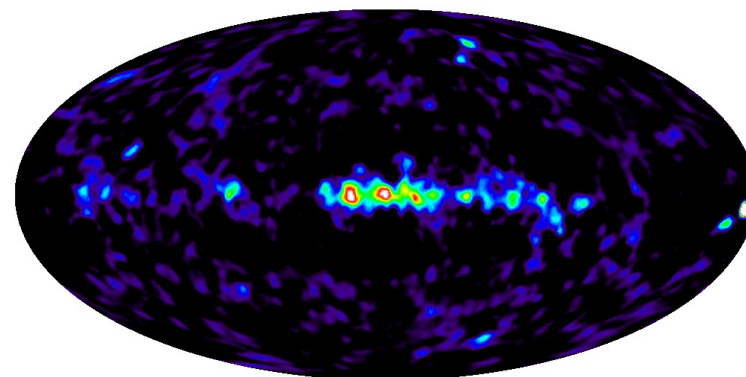
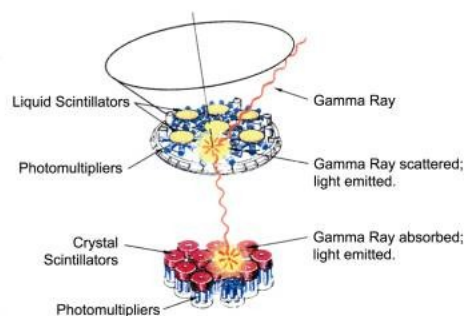


# COMPTEL reloaded: a heritage MeV data project

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Andy Strong  
MPE Garching

7th Fermi Symposium  
Garmisch-Partenkirchen  
15 - 20 October 2017



**COMPTEL (CGRO, 1991-2000) 1- 30 MeV data being reanalysed.**  
**\* New data processing: better background rejection, full mission data.**  
**\* Image processing: new all-sky images.**

# COMPTEL Analyses in 21. Century

## Why?

- **1. COMPTEL Catalog covers only part of the mission**
- **COMPTEL science not “fully” exploited**
  - late-mission data not really explored
  - no whole-mission maps (except  $^{26}\text{Al}$ )
  - no systematic source searches
  - no whole-mission analyses for sources (except Crab)
- **no more sensitive MeV mission for years**
- **improved computer power available**

## How?

- **software to automate the analyses**
- **systematic source searches all-sky analyses (incl. diffuse model handling) for**
  - different time periods
  - new energy bands to avoid background lines (standard.: 0.75-1, 1-3, 3-10, 10-30 MeV; revised: 0.9-1.7, 1.7-4.3, 4.3-9, 9-30 MeV )
- **goal: 2. COMPTEL Source Catalogue**
  - several other scientific issues
- **effort to improve COMPTEL sensitivity**

# COMPTEL Maximum Entropy Imaging

Original (by AWS) in 1998 using Cray supercomputer  
MEMSYS5 Package (John Skilling)

New developments:

Imaging software (with Martin Reinecke, Torsten Ensslin @ MPA Garching)

HealPix equal-area all-sky projection for both data and image  
Fast convolution on sphere (COMPTEL PSF annuli up to  $\sim 30^\circ$ )  
Parallel architecture

Data (Werner Collmar @ MPE Garching)

New event processing, better background rejection with TOF and PSD  
New energy ranges to avoid background lines and better spectral coverage  
Full data set from whole mission

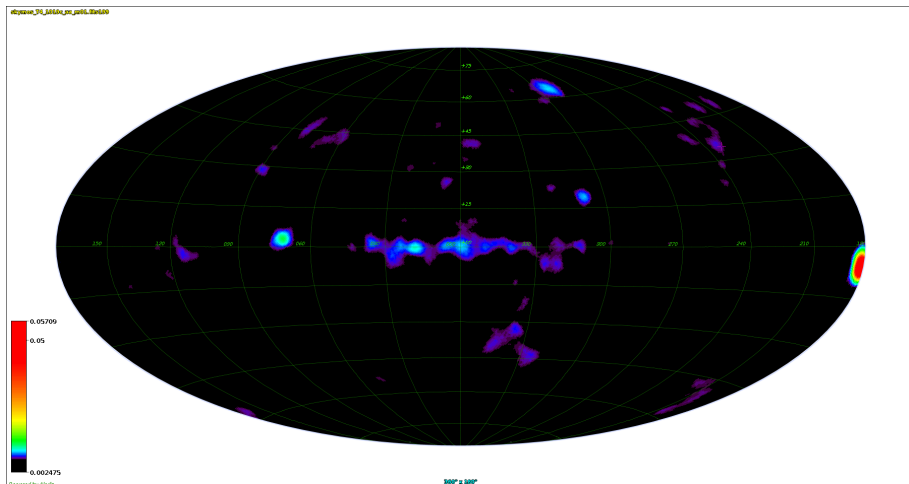
For more details see:

[http://www.mpe.mpg.de/~aws/talks/eastrogam\\_2017\\_strong.pdf](http://www.mpe.mpg.de/~aws/talks/eastrogam_2017_strong.pdf)

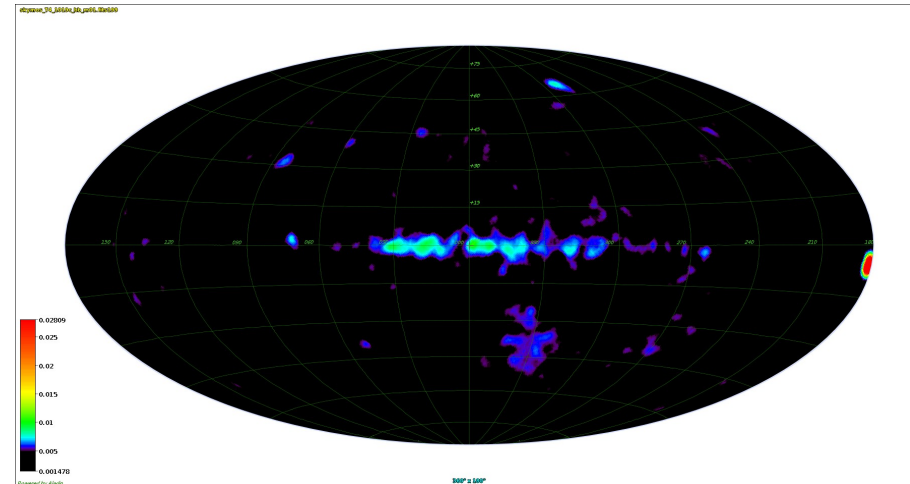
# COMPTEL Maximum Entropy All-Sky Maps, full mission data

## New energy bands

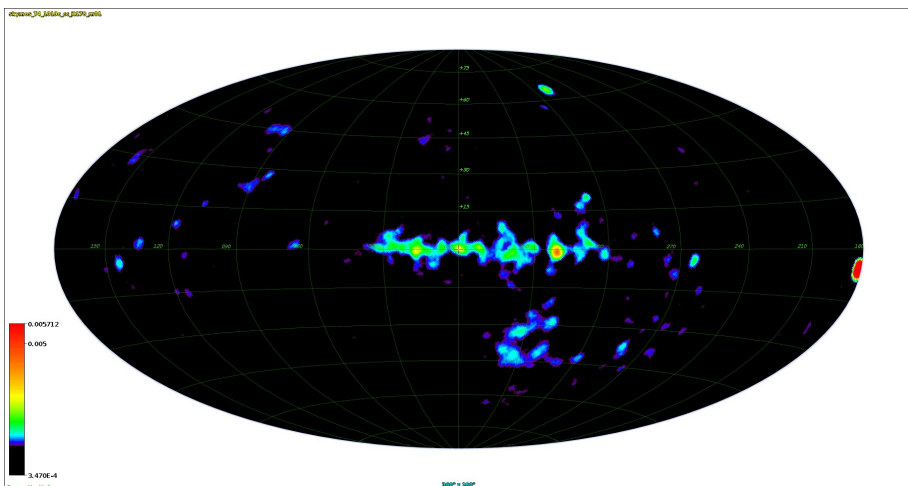
### 0.9 – 1.7 MeV



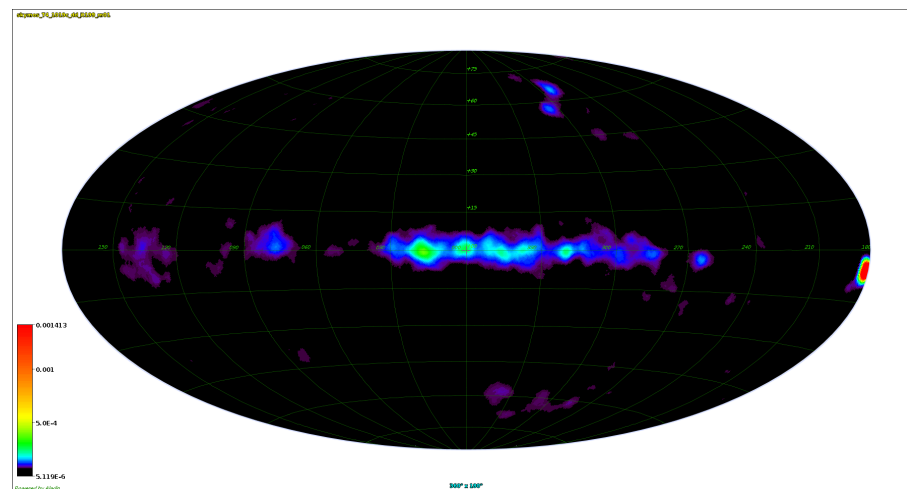
### 1.7 - 4.3 MeV



### 4.3 - 9.0 MeV



### 9.0 – 30 MeV



PRELIMINARY

TOF-IV