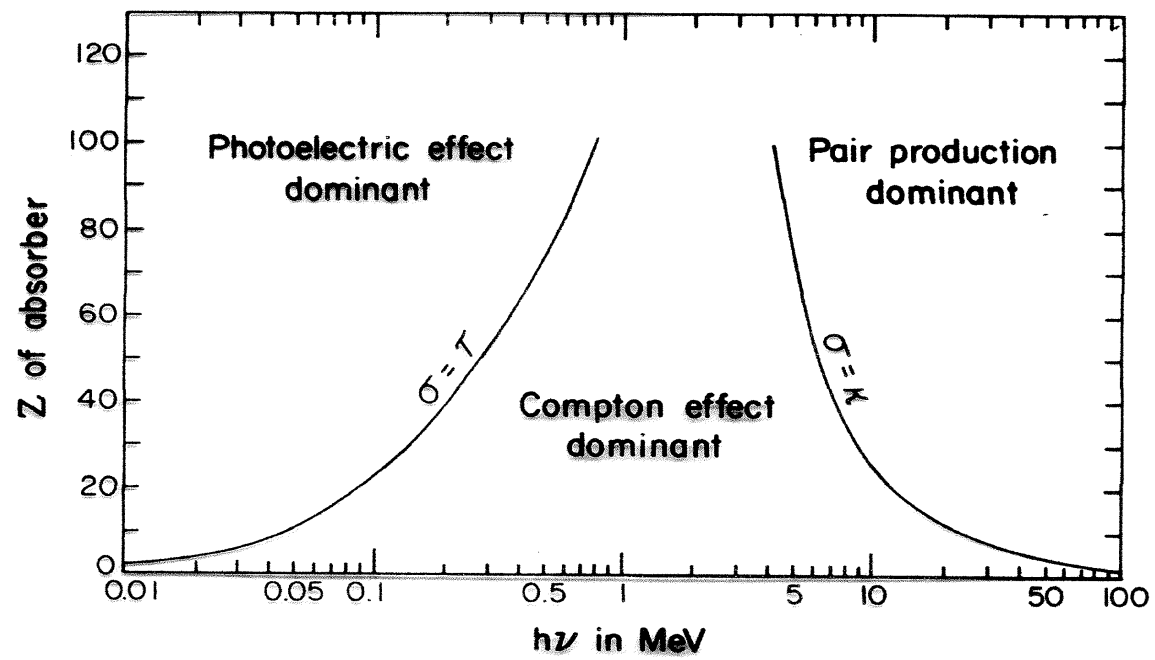


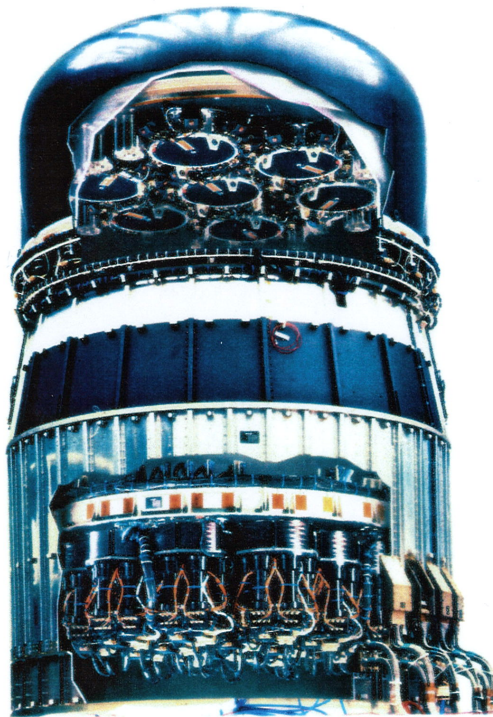
THE HISTORY OF COMPTEL

Volker Schönfelder

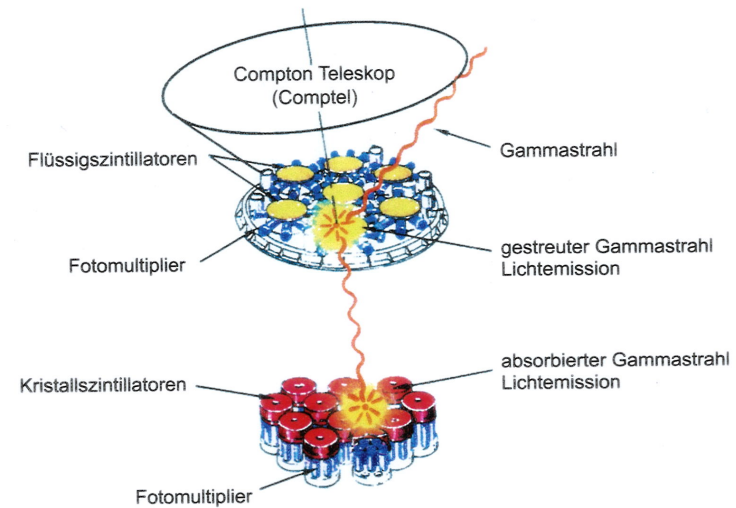




Compton Teleskop COMPTEL



Meßprinzip COMPTEL



How relaxing,
these COMPTEL
team-meetings!

I am
sceptical
that this is
the best
solution

I am afraid,
this will be to
expensive



The best parts
of the UNH -
meetings are the
lobster - dinners

Hm,
that's really
delicious



I don't see any
reason to be so
happy

Building COMPTEL
seems to be
amusing





Jim [unclear]

Best Wishes from the STS-37 Crew

Steve [unclear]

Ken [unclear]

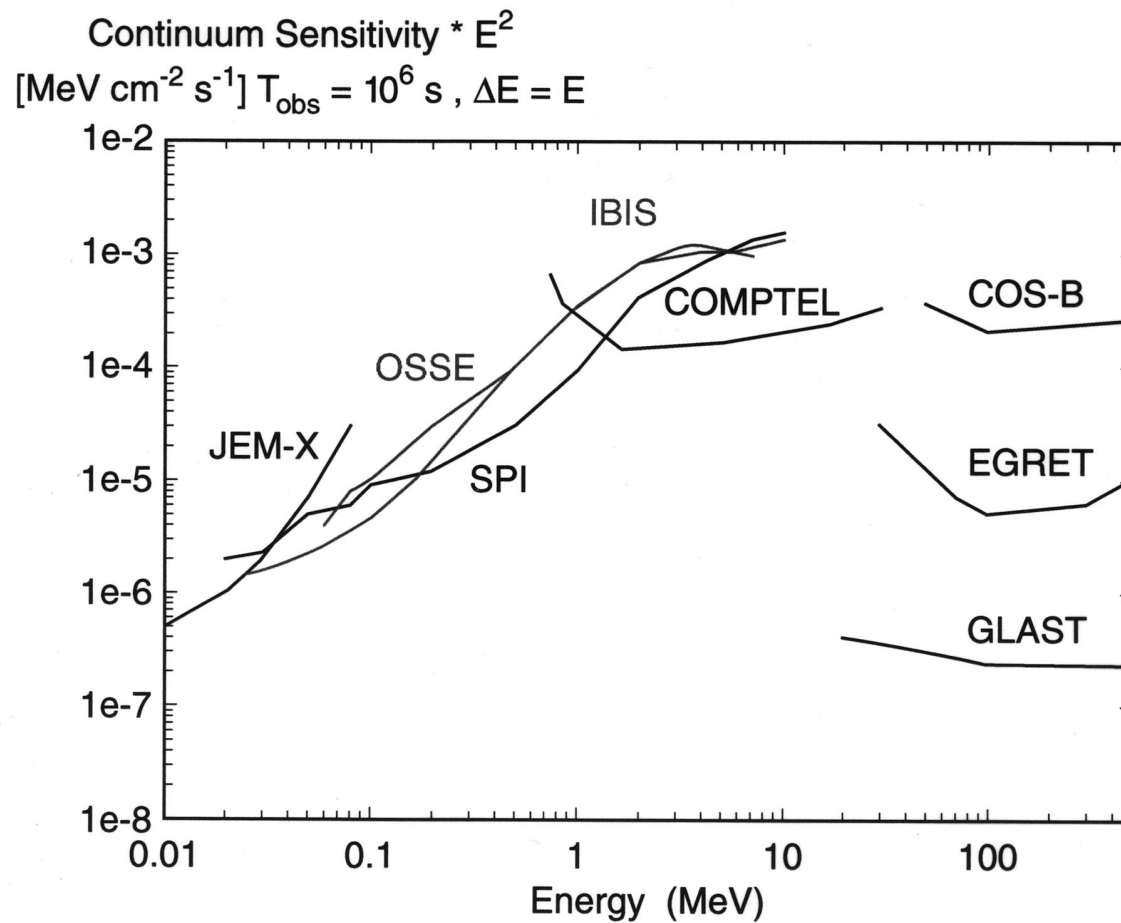
Janet Garwin

[unclear]



When you were up
in space, did you get
your per-diem every 90
minutes?





Presently achieved continuum sensitivities

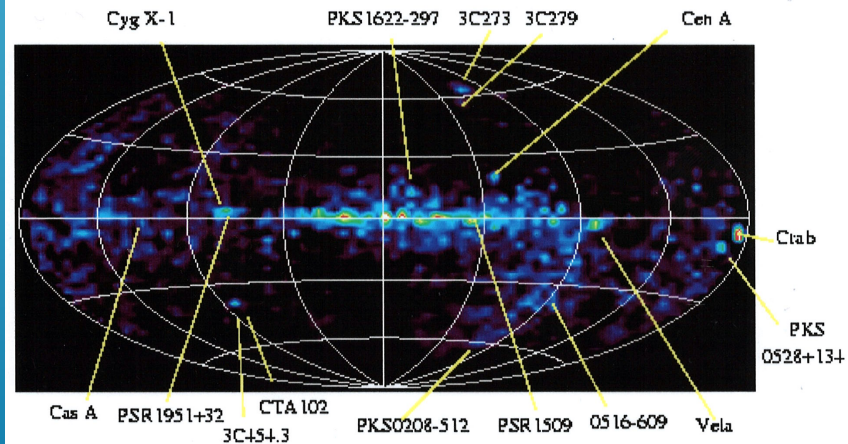
HIGHLIGHT RESULTS FROM COMPTEL

- First-ever all-sky **continuum maps** in the 1 – 30 MeV range.
- All-sky **source catalogue** in the 1 to 30 MeV range with 32 celestial objects.
- Detection of **nucleosynthesis gamma-ray lines**
 - all-sky map in the 1.809 MeV ^{26}Al line
 - 1.156 MeV ^{44}Ti line from **Cas A** and possibly from **RX J 0852-4622**
 - hints for ^{56}Co lines from **SN 1991T**.
- Detailed study of the **diffuse Galactic** gamma-ray emission (spatial structure and energy spectrum).
- Observations of spectral **breaks in the MeV range** as characteristic of many **gamma-ray blazers**.
- Revision of the energy spectrum of the **diffuse cosmic background** (non-existence of the “MeV-bump”).
- Rapid localization of cosmic **gamma-ray bursters**.
- Observation of “**long-duration**” **solar flares** with 6 to 8 hours lasting γ -ray and neutron emission.
- First map of an astronomical object (**the Sun**) in the light of energetic **neutrons**.

COMPTEL 1 to 30 MeV all-sky Map

The COMPTEL 1 to 30 MeV all-sky map in continuum gamma radiation represents the results of the first-ever survey of the sky at these energies. The concentration of the emission along the Galactic plane is the most striking aspect of the map. The plane stands out clearly against the rest of the sky indicating that most of the measured gamma-ray fluxes come from regions or objects inside the Galaxy. The dominant Galactic continuum emission seems to come from interstellar space, from cosmic-ray interactions, and is visible as diffuse Galactic radiation. Superimposed on the large-scale Galactic emission are point-like sources (like Crab, Vela, Cyg X-1), but many of the Galactic point sources remain unidentified at this time. A significant contribution of unresolved point sources to the apparently diffuse Galactic emission cannot be excluded. At medium and high Galactic latitudes, a few of the gamma-ray blazars, discovered by EGRET, are visible in the COMPTEL map, as well. Examples are 3C 273, 3C 279, and PKS 0528+134. The radio galaxy Cen A is also visible at MeV gamma rays. Some of the extragalactic objects detected by COMPTEL, are not visible in this map, because they flare-up only occasionally : on average they are too weak to be visible in this time-averaged all-sky map.

COMPTEL 1-30 MeV Phases 1-6



COMPTEL Source Catalog

Galactic coordinate system
AITOFF projection

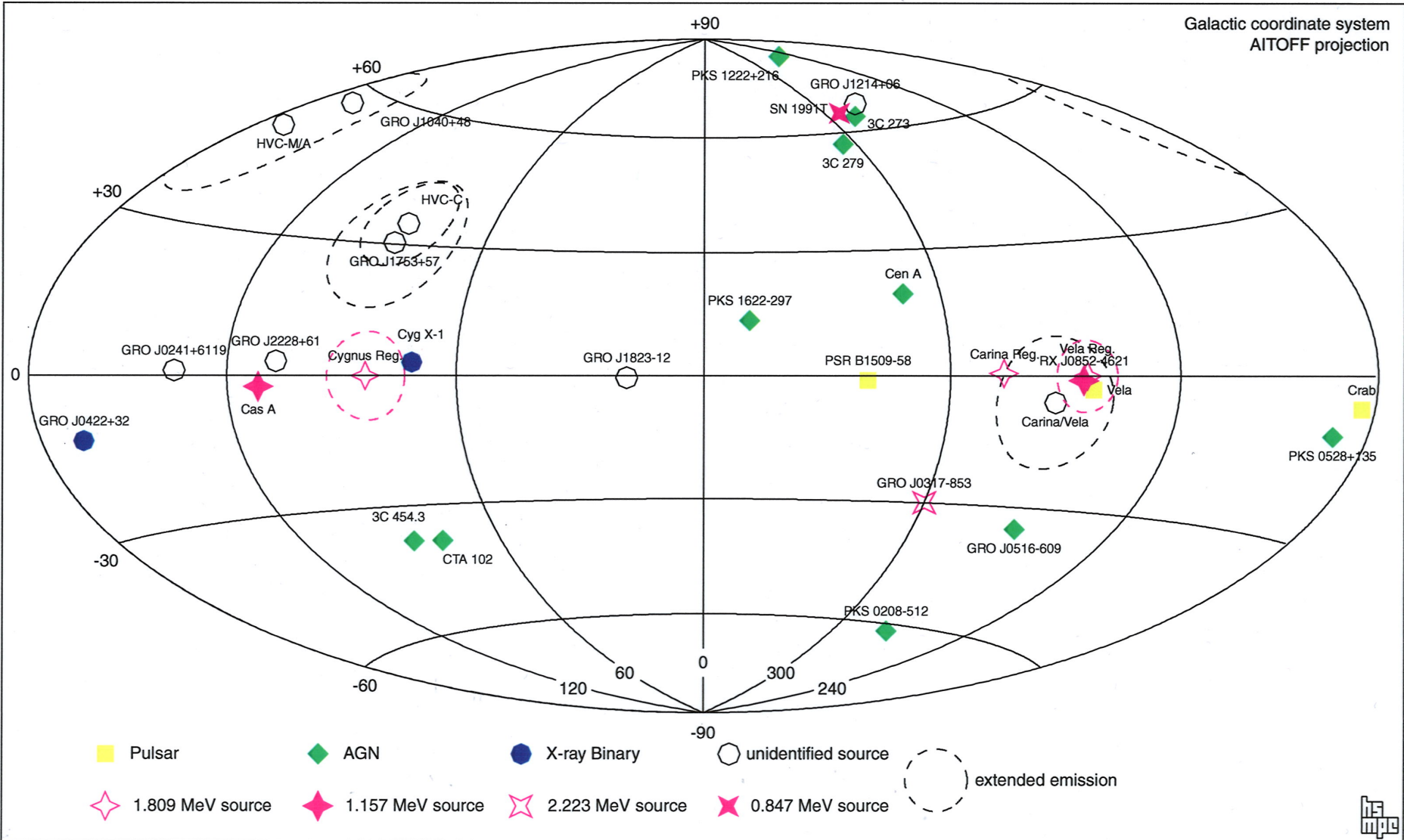
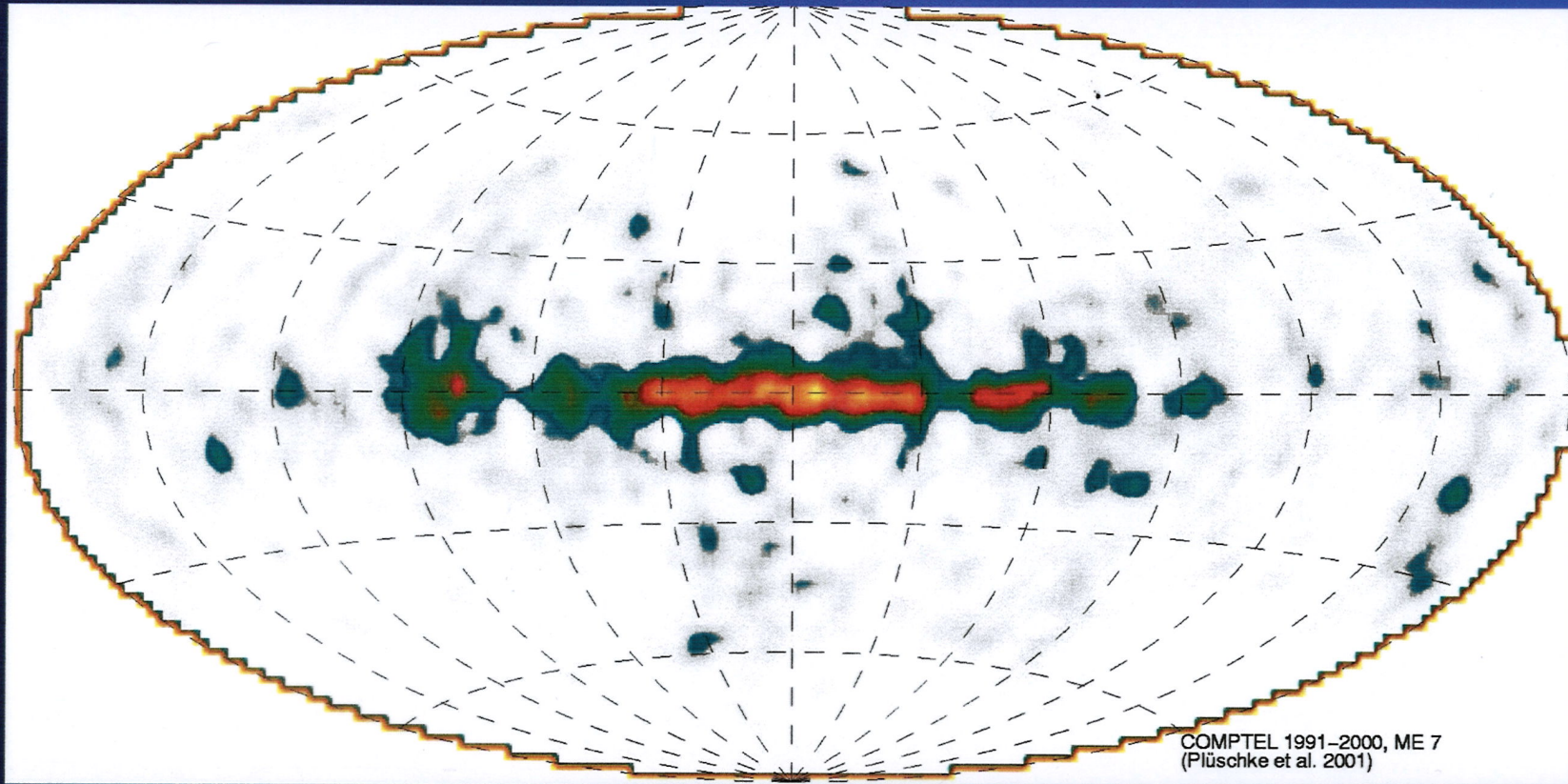


TABLE 2. Summary of Most Significant COMPTEL Source Detections.

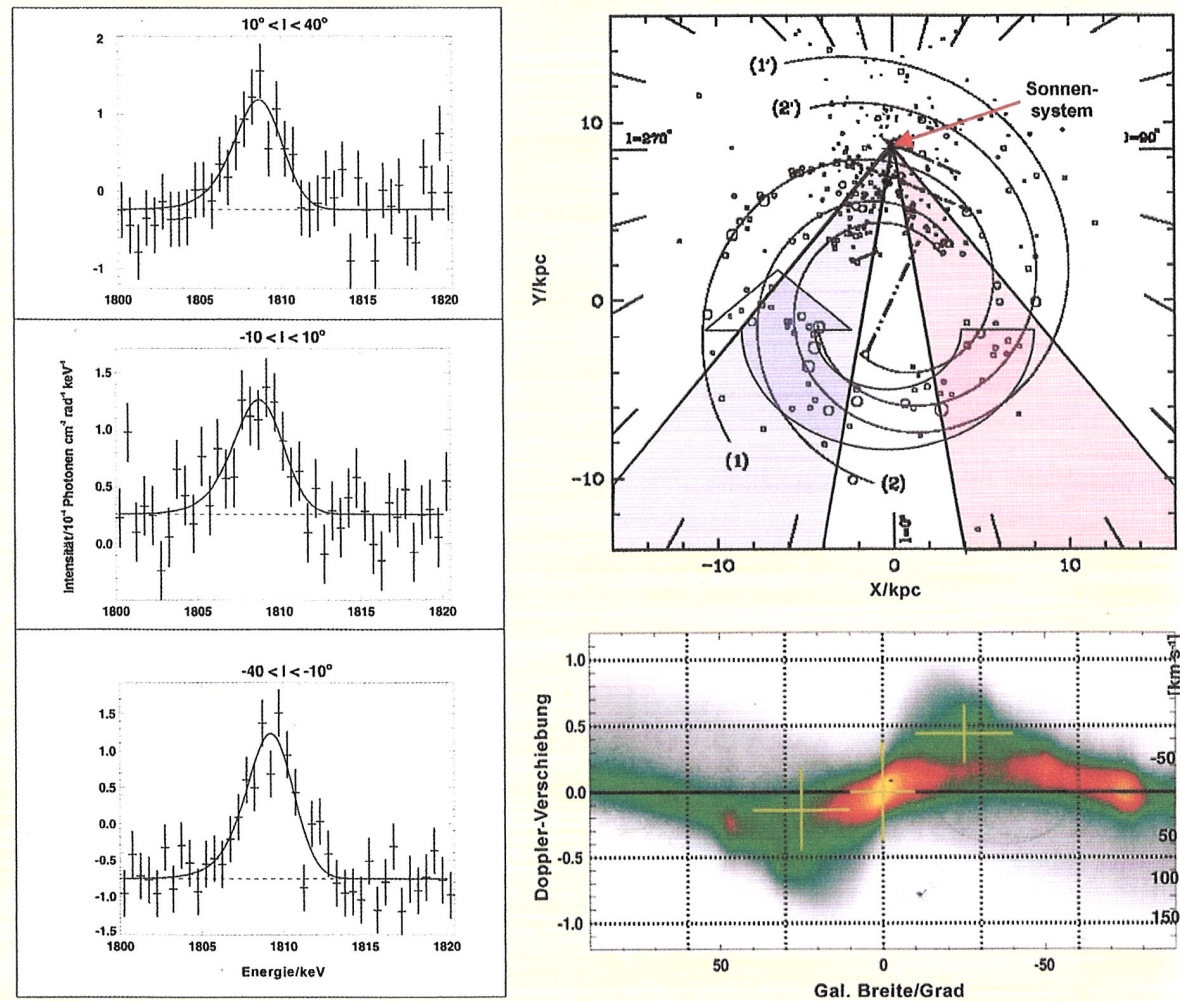
Type of Source	No. of Sources	Comments
Spin-Down Pulsars:	3	Crab, Vela, PSR B1509-58.
Stellar Black-Hole Candidates:	2	Cyg X-1, Nova Persei 1992 (GRO J0422+32).
Supernova Remnants: (Continuum Emission)	1	Crab nebula.
Active Galactic Nuclei:	10	CTA 102, 3C 454.3, PKS 0528+135, GRO J0516-609, PKS 0208-512, 3C 273, PKS 1222+216, 3C 279, Cen A, PKS 1622-297.
Unidentified Sources:		
• $ b < 10^\circ$	4	GRO J1823-12, GRO J2228+61 (2CG 106+1.5), GRO J0241+6119 (2CG 135+01), Carina/Vela region (extended).
• $ b > 10^\circ$	5	GRO J1753+57 (extended), GRO J1040+48, GRO J1214+06, HVC complexes M and A area (extended), HVC complex C (extended).
Gamma-Ray Line Sources:		
• 1.809 MeV (^{26}Al)	3	Cygnus region (extended), Vela region (extended, may include RX J0852-4621), Carina region.
• 1.157 MeV (^{44}Ti)	2	Cas A, RX J0852-4621 (GRO J0852-4642).
• 0847 and 1.238 MeV (^{56}Co)	1	SN 1991T.
• 2.223 MeV (n-capture)	1	GRO J0317-853.
Gamma-Ray Burst Sources: (within COMPTEL field-of-up to Phase IV/Cycle-5)	31	Location error radii vary from 0.34° to 2.79° (mean error radius: view 1.13°).

COMPTEL 1.809 MeV Survey



COMPTEL 1991–2000, ME 7
(Plüschke et al. 2001)

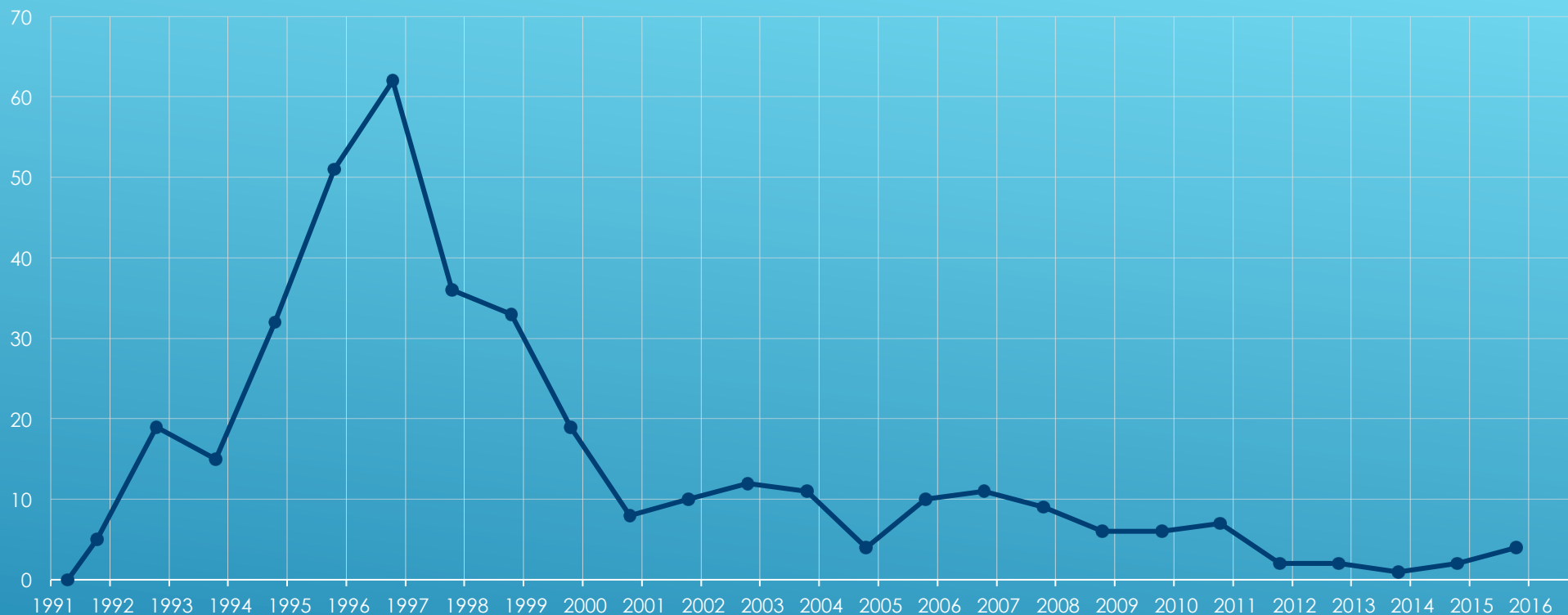
ABB. 5 | DOPPLER-VERSCHIEBUNG DER ^{26}Al -LINIE



Spektrallinie des ^{26}Al -Zerfalls, entlang unterschiedlicher Sichtlinien in unserer Galaxis (drei fächerförmige Bereiche wie im Bild rechts oben gezeigt). Die großräumige Rotation der Milchstraßenebene (breiter Pfeil rechts oben) führt zu Relativbewegungen von etwa 100 km s^{-1} zwischen dem ^{26}Al im interstellaren Gas und dem Sonnensystem. Dies äußert sich in Doppler-Verschiebungen der Linien (linke Spalte). Die gesamte Doppler-Verschiebung in Abhängigkeit von der galaktischen Längenkoordinate (rechts unten) lässt sich gut mit einem Rotationsmodell der Milchstraße beschreiben (farbig dargestellt).



NUMBER OF REFEREED COMPTEL PUBLICATIONS PER YEAR



Total number of refereed GRO publications from April 1991 to March 2016:

EGRET: 1173

BATSE: 1105

COMPTEL: 377

OSSE: 242

LS 5039: The COMPTEL MeV Source GRO J1823-12

