

FAKULTÄT für PHYSIK  
LUDWIG-MAXIMILIANS-UNIVERSITÄT  
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT  
TECHNISCHE UNIVERSITÄT MÜNCHEN  
MÜNCHEN/GARCHING

## MLL-KOLLOQUIUM

Donnerstag, 06.02.2014, 16<sup>15</sup> Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1  
Treffen zum gemeinsamen Kaffee 16 Uhr

**Prof. Roland Diehl**

(MPE, Garching / Universe Cluster)

### Observing Radioactivity from Cosmic Sources

Gamma-ray lines from radioactive decay of unstable isotopes co-produced by nucleosynthesis in massive stars and supernovae have been measured since more than thirty years. Over the past ten years, INTEGRAL complemented the first sky survey made by COMPTEL. The  $^{26}\text{Al}$  isotope with 1 My decay time had been first direct proof of currently-ongoing nucleosynthesis in our Galaxy. This has now become a tool to study the My history of specific source regions, such as massive-star groups and associations in nearby regions, which can be discriminated from the galactic-plane background, and the inner Galaxy, where Doppler-shifted lines add to the astronomical information about bar and spiral structure. Recent findings suggest that superbubbles show a remarkable asymmetry, on average, in the spiral arms of our galaxy.  $^{60}\text{Fe}$  is co-produced by the sources of  $^{26}\text{Al}$ , and the isotopic ratio from their nucleosynthesis encodes stellar-structure information. Annihilation gamma-rays from positrons in interstellar space show a puzzling bright and extended source region central to our Galaxy, but also may be partly related to nucleosynthesis.  $^{56}\text{Ni}$  and  $^{44}\text{Ti}$  isotope gamma-rays have been used to constrain supernova explosion mechanisms. In this talk the themes and latest results will be presented, and their astrophysical interpretations will be discussed.

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