

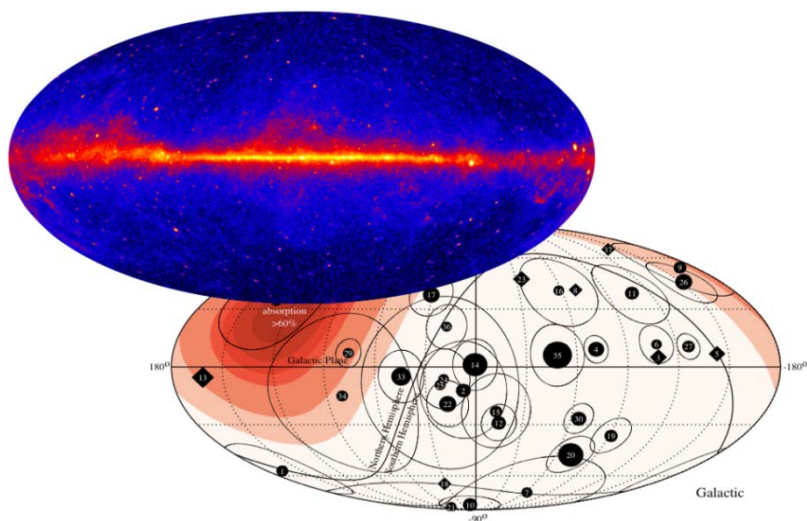


# Neutrinos & gamma-rays – Complementary views on the high-energy universe.

**Markus Ackermann (DESY)**

**Tuesday, 13 January 2015, 16:45 h, Auditorium**

Non-thermal processes in our cosmos have been studied successfully for the last two decades through the interpretation of  $\gamma$ -ray data. However, the universe is transparent to gamma rays only at MeV and GeV energies. Above 100 GeV,  $\gamma$ -rays are increasingly absorbed in interactions with the omnipresent radiation background from stars and the CMB. At TeV energies  $\gamma$ -ray observations are restricted to our local cosmic environment, at hundreds of TeV even to our own Galaxy. Neutrinos fortunately do not have this limitation. They can travel cosmological distances and escape from dense environments without significant absorption. They are therefore our only direct probe of non-thermal processes above tens of TeV for most of our universe. I will show what we can learn about the sites of cosmic-ray acceleration, the physics processes involved, and the environmental conditions around these sites from the observations of extragalactic gamma-ray emission in the GeV regime in combination with the astrophysical neutrinos recently discovered by IceCube above 10 TeV.



**Coffee, tea and cookies will be served at 16.30**

**After the seminar there is a chance for private discussions with the speaker over wine and pretzels**

*The GeV gamma-ray and the TeV neutrino sky*

