Diffuse and Molecular Group Newsletter

This month, the diffuse group has been active preparing its contributions to ICRC. Several papers of LAT interest were reported at the conference by members of the diffuse group or other persons, namely:

- on the LAT capability to measure local GeV to TeV electrons (Moiseev et al., arXiv:0706.0882)
  *an update of the diffuse models developed for LAT analyses (Porter et al., arXiv:0706.0221) including new gas rings and ISRF, anisotropic inverse Compton scattering, and the new cross-section for pi0 production from Tune Kamae's work.
- the inclusion of nuclei interactions in the gas gamma-ray emissivity (Huang et al., arXiv:0706.0506) which results in spectral hardening at GeV energies. The cross-section is available at http://cherenkov.physics.iastate.edu/gamma-prod. The hardening is insufficient to explain the GeV excess. However, the possible instrumental origin of the EGRET GeV excess, as discussed by some EGRET team members, has appeared on arXiv:0705.4311 (Stecker, Hunter, and Kniffen). The emissivity hardening due to nuclei is important for the future interpretation of SNR GeV to TeV emission and for the diffuse models.
- on the gamma-ray spectrum resulting from hadronic interactions in the interstellar gas surrounding SNRs (Moskalenko et al., arXiv:0705.3854)

What you have never dared ask about cosmic ray propagation has an answer in the annual review by Strong, Moskalenko, and Ptuskin that has appeared on http://arjournals.annualreviews.org/doi/abs/10.1146/annurev.nucl.57.090506.123011

At the ICRC, the HESS collaboration has reported a dozen new sources from their extended inner Galaxy. The fact that nearly all Galactic HESS sources appear to be extended (few arcminutes beyond the HESS 6' resolution) although they are not consistent with an extension of the diffuse GeV emission, is important for the future LAT diffuse modelling and source extraction.

Work is going on in the diffuse group on gas distribution for GALPROP and on the anisotropic IC emission due to the bright O and B stars distribution within 500 pc. The need for specific 'diffuse' tools is being evaluated.We had the addition of 5 new members to the group during June/July (Jean-Luc Starck, Omar Tibolla, Tom Dame, Markus Ackermann, and Guðlaugur Jóhannesson).