



## Poster session 3 – Wednesday 6 July

### P3.084 Towards a complete $\Delta(27) \times SO(10)$ SUSY GUT

F Björkeröth<sup>1</sup>, F José de Anda<sup>2</sup>, I de Medeiros Varzielas<sup>1</sup> and S F.King<sup>1</sup>

<sup>1</sup>University of Southampton, UK, <sup>2</sup>Universidad de Guadalajara, Mexico

We propose a renormalisable model based on  $\Delta(27)$  family symmetry with an  $SO(10)$  grand unified theory (GUT) leading to a novel form of spontaneous geometrical CP violation. The symmetries, including  $\Delta(27)$  and  $Z_9 \times Z_{12} \times Z_4^R$ , are broken close to the GUT breaking scale to yield the minimal supersymmetric standard model (MSSM) with the standard R-parity.  $SO(10)$  is broken via  $SU(5)$  with doublet-triplet splitting achieved by a version of the Dimopoulos-Wilczek (missing VEV) mechanism. Low-scale Yukawa structure is dictated by the coupling of matter to  $\Delta(27)$  antitriplets  $\bar{\varphi}$  whose VEVs are aligned in the CSD3 directions by the superpotential. Light physical Majorana neutrinos masses emerge from a specific implementation of the seesaw mechanism within  $SO(10)$ . The model predicts a normal neutrino mass hierarchy with the best-fit lightest neutrino mass between 0.32 – 0.38 meV, CP-violating oscillation phase  $\delta^l \approx (275 - 280)^\circ$  and the remaining neutrino parameters all within  $1\sigma$  of their best-fit experimental values.