Contribution ID: **262** Type: **Posters (last call deadline 30th June)**

Focus Points of Bayesian Naturalness in MSSM and NMSSM

The Higgs boson discovery stirred interest in next-to-minimal supersymmetric models, due to the apparent fine-tuning required to accommodate it in minimal theories. To assess their naturalness, we compare fine-tuning in a $\mathbb{Z}3$ conserving semi-constrained Next-to-Minimal Supersymmetric Standard Model (NMSSM) to the constrained MSSM (CMSSM). We contrast popular fine-tuning measures with naturalness priors, which automatically appear in statistical measures of the plausibility that a given model reproduces the weak scale. Our comparison shows that naturalness priors provide valuable insight into the hierarchy problem and rigorously ground naturalness in Bayesian statistics. For the CMSSM and semi-constrained NMSSM we demonstrate qualitative agreement between naturalness priors and popular fine tuning measures. Thus, we give a clear plausibility argument that favours relatively light superpartners.

Parallel Session

Supersymmetry: Models, Phenomenology and Experimental Results

Author: KIM, Doyoun (IBS-CTPU)

Co-authors: Dr FOWLIE, Andrew (Monash University); Dr FARMER, Benjamin (Oskar Klein Centre); BALAZS, Csaba (Monash University); Dr HARRIES, Dylan (Charles University Prague); ATHRON, Peter

Presenter: KIM, Doyoun (IBS-CTPU)