

Contributed Talk

Splinter eROSITA

WEAK-LENSING MASS CALIBRATION OF THE SUNYAEV-ZEL'DOVICH  
EFFECT USING APEX-SZ GALAXY CLUSTERS

A. Nagaraajan<sup>1</sup>, F. Pacaud<sup>1</sup> and APEX-SZ collaboration

<sup>1</sup> *Argelander Institut fuer Astronomie, University of Bonn, Auf dem Hügel 71,  
Bonn-53121*

The use of galaxy clusters as precision cosmological probes relies on accurate determination of their masses. However, inferring the relationship between cluster mass and observables from direct observations is difficult and requires adequate control of the systematic effects caused by sample selection. In this talk, I present results on the mass ( $M_{500}$ ) calibration of the integrated Comptonization ( $Y_{\text{SZ}}$ ) using weak-lensing estimates for an X-ray luminosity ( $L_X$ ) selected sample. To mitigate the sample selection biases, a novel Bayesian approach was used to fit the  $L_X - M_{500}$  and  $Y_{\text{SZ}} - M_{500}$  relations jointly. A special focus was also placed on the role played by the intrinsic covariance of cluster observables and the correlation of the intrinsic covariance of X-ray luminosity and integrated Comptonization at fixed mass. Our constraints on the correlation favour a positive value at  $1\sigma$ . Ignoring this correlation tends to bias the  $Y_{\text{SZ}} - M_{500}$  relation, even though the Comptonization played no role in the sample selection. I discuss the impact of such systematic biases in scaling relations on some near-future cluster-based cosmological experiments and report that the systematic effect could dominate the cosmological error budget.