

**Stanford University**  
**Department of Statistics**

DEPARTMENTAL SEMINAR

4:30pm, Tuesday, July 24, 2018  
Sloan Mathematics Center Room 380C

Refreshments served at 4pm in Sequoia Lounge.

**Speaker:** Sylvain Sardy, *University of Geneva*

**Title:** **Model selection with Lasso-Zero: Adding straw to the haystack to better find needles**

**Abstract:**

The high-dimensional linear model  $y = X\beta_0 + \epsilon$  is considered and the focus is put on the problem of recovering the support  $S_0$  of the sparse vector  $\beta_0$ . We introduce lasso-zero, a new  $\ell_1$ -based estimator whose novelty resides in an “overfit, then threshold” paradigm and the use of noise dictionaries for overfitting the response. The selection of the threshold is based on a pivotal statistic and does not require knowledge of the noise level. We prove that this procedure requires weaker conditions on  $X$  and  $S_0$  than the lasso for exact support recovery, and controls the false discovery rate for orthonormal designs when tuned by the quantile universal threshold.