

Title and Abstract for B. Collins' talk, Tokyo University, Sept 2010

July 19, 2010

- **Speaker:** Benoît Collins (University of Ottawa and CNRS Lyon 1)
- **Title:** Eigenvalues of vectors in a random subspace.
- **Abstract:** In the space of $n \times k$ complex matrices, we consider a random subspace V of dimension N . Under the assumption that k is fixed, n goes to infinity and $N \sim tkn$ for a parameter t in $(0, 1)$, we prove that the random set obtained as the collection of possible singular values of matrices A in V is actually almost surely deterministic as $n \rightarrow \infty$

We describe the limiting set with the help of free probability. By passing, we state a new law of large numbers for the eigenvectors of some random matrix models.

We will also discuss applications to additivity problems in quantum information theory.

This is joint work with Serban Belinschi (Saskatoon) and Ion Nechita (Ottawa)