1046-55-1554   **yuliy baryshnikov***, 600 mountain avenue, murray hill, NJ 07974. *Counting objects in dense sensor networks: a topological integral transform.* Preliminary report.

Information fusion in dense, redundant sensor networks with nodes of low power and intelligence is one of the major problems in the theory of distributed sensing. Even the simple task of determining the number of the objects in the supervised domain becomes nontrivial given the intrinsic overcounting of the objects.

We approach this question of target counting from a topological perspective, reducing the task to a problem of integral calculus with respect to Euler characteristic. The solution we (this is joint work with Robert Ghrist, UPenn) proposed earlier failed to address the situation when the targets' footprints have vanishing Euler characteristic (as, e.g., in the important case of annuli). In this talk I will outline some new results addressing this case. (Received September 16, 2008)