Neostability Theory
29 January - 3 February 2012

Problems

Problem 1 (Kobi Peterzil)
Let G be a definable group in an o-minimal theory, and $X \subset G$ a definable subset. Does $\langle X \rangle$ always contain a definable generic set Y in the sense that boundedly many translates of Y cover $\langle X \rangle$? (Equivalently, any definable subset of $\langle X \rangle$ should be covered by finitely many translates of Y.)
The answer is positive for vector groups in o-minimal expansions of the reals.

Problem 2 (Enrique Casanovas)
Is there a simple ω-categorical non-low theory?
Note that it cannot be supersimple nor CM-trivial.

Problem 3 (Martin Ziegler)
Consider any n-ary relation R on $(\mathbb{C}, +, \cdot)$. Is there a projective relation R' (in the sense of descriptive set theory) such that $(\mathbb{C}, +, \cdot, R) \equiv (\mathbb{C}, +, \cdot, R')$?

Problem 4 (John Baldwin)
Let M be superstable saturated and $I \subset M$ indiscernible. Does every permutation of I extend to an automorphism of M ?

Problem 5 (Sergeï Starchenko)
In a dependent theory, consider a formula $\phi(x, y)$ of dp-rank d (or vc*-density d). Suppose the definable family $\Theta = \{\phi(M, y) : y \models \theta\}$ is $(d + 1)$-consistent. Can we partition Θ into finitely many definable consistent subfamilies?
Such a partition exists by the fractional Helly number; the problem is to get it definably.

Problem 6 (Frank Wagner)
Do simple one-based theories have (weak) elimination of hyperimaginaries?

Problem 7 (Itaï Ben Yaacov)
What is the topological complexity for a theory to be simple (or stable, NIP, rosy)?
Answer: G_δ.
In a stable theory, is one-basedness a meagre or co-meagre property?

Problem 8 (Ludomir Newelski)
Is rosyness an absolute property?

Problem 9 (John Goodrick)
Let T be strongly dependent and T_P the theory of saturated elementary pairs of T . Let $\phi(x, y)$ be an L-formula. How is dp-rank$_L(\phi)$ related to dp-rank$_{L_P}(\phi)$?
Note: We should assume that T_P is also strongly dependent.

Problem 10 (Predrag Tanovic)
Let G be a superstable simple group of infinite rank, and p its generic type. Is there n such that $p^{(n)}$ is non-isolated?
Note: No $\aleph_0$-categorical stable group is simple.

Problem 11 (Artem Chernikov)
Let M be an elementary submodel of N, and suppose $p \in S(N)$ divides over M . It has dependent dividing if there is an instance of a dependent formula in p which divides over M. The theory has dependent dividing if all types over models have.
Note: Then T is NTP_2. If T is simple, dependent dividing equals stable forking.
Do all NTP_2 theories have dependent dividing?
Is there an unstable class for which stable forking holds?

Problem 12 (Artem Chernikov)
Let A be an extension base for non-forking in an NTP_2 theory. Find a and b with the same Lascar strong type over A, but such that the Lascar distance between them equals 3.