An axiomatization of the hyperfinite world

Petr Andreyev, Moscow
petr@sherwood.ru

After the invention of nonstandard analysis there can be no doubt that "finite" and "continuous" are not opposites. Moreover, the universe of sets can even be thought of as genuinely hyperfinite which means that hyperfinite structures could be taken as objects of the primary interest while continuous ones serve as their approximations. The theory of hyperfinite sets (THS) is a theory in the $\in$–language obtained by introducing, for the universe of hereditarily finite sets, some additional principles which, in particular, imply the existence of relevant structures behaving as usual infinite ones. Therefore it is possible in THS to use continuous mathematics for investigating hyperfinite structures. We will present the axioms of THS and briefly discuss ways of doing mathematics in it. (This is joint work with E.I. Gordon, Eastern Illinois University)

The work was partially supported by RFBR grant 03-01-00757.