Lecture 1: Why and What

August 26, 2003

1. class organization; questions, questions, questions, readings

    (a) my quasimin notes; emaec

    (b) Morley: omitting classes of elements, Categoricity in power

    (c) Zilber and Shelah webpages: first Zilber is Quasiminimal excellence paper.

    (d) Shelah: 87ab, 88?, 394, 576!, 600, (705, 734 may not exist yet)

    (e) Lessmann notes

    (f) Grossberg (website) and Hytinnen

2. limits of first order

    (a) vector spaces over $\mathbb{R}$

    (b) complex exponentiation

    (c) Banach spaces

3. big question: To what extent do the structural characterizations of stability theory depend on the formulation in first order logic?

4. the choice of syntax

    (a) infinitary logic

    (b) $L(Q)$

    (c) finite diagrams – define

    (d) connections of infinitary logic and finite diagrams will be a lecture

    (e) Abstract Elementary Classes

5. Amalgamation properties

    (a) compactness

    (b) amalgamation over sets

    (c) excellence (doesn't quite fit)

    (d) amalgamation over models

6. Zilber thesis: Natural mathematical structures have canonical descriptions (canonical equals categoricity in power)

7. Shelah program

    (a) Categoricity in power is a natural question

    (b) When are all models of a class $\boldsymbol{K}$ determined by those of the smallest size?

8. background

    (a) Morley's theorem: stability implies an ω_1-saturated model in every cardinality. Indiscernibles, prime models, and formulas are used to show that if there is a non-saturated model anywhere, then there is non ω_1-saturated model in every cardinal.

    (b) Keisler's theorem: arb large models and cat model homogeneous

    (c) Survey of Shelah results?