Math. Forschungsinstitut
Oberwolfach
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MATHEMATISCHES FORSCHUNGSINSTITUT OBERWOLFACH

T a g u n g s b e r i c h t 37/1991

Fine Structure

25.8. bis 31.8.1991

Organised by R. Jensen (Oxford) England

The meeting at Oberwolfach was devoted to recent developments in the inner model programme of Set Theory. The mornings consisted of a series of lectures by John Steel, discussing Fine-Structure and Iteration Trees. Two or three shorter papers were presented every afternoon by other participants.

The Abstracts

H.D. Donder - München Universität

For a normal filter F on ω_1 let (*) denote the property that every function from ω_1 to ω_1 is bounded by a canonical function on a set of F-measure one. It was shown that the following are equivalent:

(a) the club filter on ω_1 satisfies (*),

(b) some normal filter on ω_1 satisfies (*),

(c) there is a regular limit of measurables.

Moti Gitik - Tel Aviv University

The main ideas for proving the theorem below were described.

Theorem. For reasonably small α

Con (κ is a strong limit,

cofinality of $\kappa = \omega$

and $2^\kappa = \kappa^{+(\alpha+2)}$)

implies Con $O(\kappa) = \kappa^{+(\alpha+2)}$.

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[illegible]

W. Mitchell - Florida

A number of topics related to $\sum^1_3$-correctness were discussed. One was Steel's proof of the following:

Theorem. Suppose that sharps exist and there is no inner model with a strong cardinal then K is $\sum^1_3$-absolute.

The question was raised whether any model M containing an iterate of K_{ω_1} is $\sum^1_3$-absolute or whether K_{ω_2} is needed.

Ernest Schimmerling - UCLA

Progress towards showing square holds in models of the form $L[E]$ was discussed.

Robert Solovay - U.C. Berkeley

The following theorem used techniques of Abraham and Shelah and settles a conjecture of Woodin.

Theorem of ZFC. There exists a complete Boolean algebra, B, with $\text{card}(B) = 2^{2^\omega}$ and

V^B satisfies (1) $2^\omega = 2^{\omega_1} = \omega_2$

(2) there is a Δ^2_1 wellordering $<$ of the reals.

In fact for any $A \subseteq$ reals $\text{Card}^1 A = \omega_1$; $<$ is uniformly definable in $\langle H_{\omega_1}, A, \epsilon \rangle$

Lee Stanley - Lehigh University

Joint work with Shelah was presented which gives a combinatorial forcing method for coding the Universe, by a real starting from ground models where 0-sharp does not exist.

The forcing method has a strategic closure which makes it iterable in a sense to be made precise and exploited in future work with Shelah.

John Steel - UCLA

The construction of an inner model K which under the hypothesis that Ω is measurable and there is no inner model with a Woodin Cardinal, computes the successor cardinals correctly and below Ω K is of the form $L[E]$ where E is a Coherent Sequence of Extenders and so has a Fine Structure Theory. Under the above hypothesis

$$K^V = K^{V(G)} \text{ where } G \text{ is } V\text{-generic for a poset } \epsilon V_\alpha.$$

An inductive definition of K was described whose logical complexity is best possible. The following application was given:

Theorem. Suppose there is a measurable cardinal and an ω_1 saturated ideal on ω_1 then there is an inner model with a Woodin Cardinal.

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Philip Welch - Bristol University

A connection between the Second Uniform Indescernible and Strong Cardinals was discussed. It was shown that

$$\underset{\sim}{\delta}^1_2 = [\mathrm{Sup}\{\rho(\leq) \text{ such that } \leq \text{ is a } \Delta^1_2\text{-boldface prewellordering of the continuum}\}] = \omega_2$$

implies there is a sharp for an inner model of a Strong Cardinal.

W. Hugh Woodin - UC Berkeley

Several methods for obtaining inner models with large cardinals were discussed, by combining inner model techniques with determinacy. The models have a $\sum^2_1$-weakly homogeneous well order of the reals and one of the form $L[E]$. Also a very brief sketch was given for proving.

Theorem. Assume that there exists $j: L(V_{\lambda+1}) \rightarrow L(V_{\lambda+1})$ with critical point $< \lambda$ then UBH and CBH fail in a generic extension of V.

Dorshka Wylie MIT

An approach to building a hierarchy for K was described, that facilitates proving combinatorial principles.

Abstract Writer: John Vickers, University of Bristol.

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