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YAZ OKULU NOTLARI

NATO ADVANCED STUDY INSTITUTES PROGRAMME AN INTERNATIONAL ADVANCED COURSE ON RINGS AND GEOMETRY *

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ÖZET

Nato ülkelerinin ileri düzeyde araştırma yapan bilim adamları arasında işbirliğini ve bilgi alışverişini sağlamak, son gelişmeleri genç bilimcilere öğretmek ve bunları muhtemel uygulama alanlarına aktarmak amacıyla yaz okulları ve bilimsel toplantılar NATO'nun bilimsel meseleler bölümünce teşvik edilmekte ve bu doğrultuda önemli görülen projeler madden desteklenmektedir.

Geometrik kavramların matematikteki avantajları, halkalar üzerinde geometrik cebirin konuları, desargsel projektif uzaylarda geometri ve polinomsal özdeşlikler, normal eğriler, latislerin koordinatlanması, değişimli olmayan cebirsel geometrinin ilkeleri, Hjelmslev düzlemleri, topolojik Hjelmslev geometrileri, Hjelmslev–Moufang düzlemlerinin genelleştirilmesi, projektif Hjelmslev düzlemleri ve bunların homomorfizmleri, matris halkalarının lineer dönüşümleri, lokal–global halkaların metrik geometrisi ve kinematik cebirler konularının doktora sonrası düzeyde işlendiği HALKALAR VE GEOMETRİ adlı Nato Yaz Okulu 2–14 Eylül 1984 tarihleri arasında İstanbul'da yapıldı.

Matematik alanında ülkemizde ilk kez gerçekleştirilen bu toplantıda kendi alanlarında isim yapmış 14 yabancı ve yerli bilim adamı çağrılı konuşmalarını toplam olarak 51 oturumda sundular. 12 ülkeden 71 matematikçi bilim adamının katıldığı bu toplantının sonuçları bir kitap halinde Reidel Publishing Company tarafından basılacaktır.

* Bu yaz okulu TÜBİTAK tarafından kısmen desteklendi.

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Bu toplantıda ayrıca 16 bilim adamına kendi araştırma sonuçlarını tebliğ etme fırsatı sağlanmış ve henüz çözülememiş bazı problemler bir oturumda tartışılmıştır. Yayınlanacak kitaba dahil edilmeyen bu tebliğlerin özetleri ile ileri sürülen açık problemleri burada sunuyoruz.

NATO SCIENCE PROGRAMME

The NATO Science Programme was established in 1958 in recognition of the crucial role of science and technology in maintaining the economic, political and military strength of the Atlantic Community. It forms one important element of what is sometimes referred to as the "third dimension" of the North Atlantic Alliance — the non — military dimension concerned with the enhancement of contacts between member nations in the areas of science and technology, culture and the problems of modern society.

The main goal of these programmes can be summarised as the enhancement of the scientific and technical capability of the Alliance by supporting co—operation and the exchange of information between scientists of member nations and by catalysing remedial action to help close gaps in scientific knowledge and research capability.

One of the currently supported programmes is called Advanced Study Institutes (ASI) : Instructional courses of approximately two weeks duration with an attendance of about 15 lecturers and 70—90 other participants. The primary objectives of an ASI are to contribute to the dissemination of advanced knowledge not yet available in standard university courses and the formation of contacts amongst scientists from different countries.

The advanced study institute RINGS AND GEOMETRY held September 2 nd to September 14 th, 1984 at Istanbul. The following topics covered in a series of 51 lectures delivered by 14 invited lecturers who are prominent in their fields: The advantages of geometric concepts in mathematics, topics in geometric algebra over rings, polynomial identities and geometry in desarguesian projective spaces, coordinatization of lattices, normal curves, principles of noncommutative algebraic geometry, finite Hjelmslev planes, topological Hjelmslev geometries, generalizing the Hjelmslev—Moufang plane, projective ring planes and their homomorphisms, linear mappings of matrix rings, metric geometry of local—global rings, kinematic algebras. The lecture notes will be published by D.Reidel Publishing company in 1985.

In additional there have been seminar sessions giving 16 participants the opportunity to report on their own results and a problem session to discuss open problems suggested by some of the 71 participants from 12 different countries. These short communications (seminars and problems) will not be included to the proceedings (book) of the conference. Therefore, we now publish summaries of the seminars and open problems.

THE LIST OF SHORT COMMUNICATIONS

Andre', J. : Near rings and non—commutative geometry.

Bozhüyük, M.E. : The use of the integral group rings in knot theory.

Brungs, H. : Chain rings.

Day, A. : Some problems from the coordinatization of arguesian lattices.

Funk, M. : On group universality and homogeneity.

Grundhöfer, T. : Compact disconnected planes as inverse limits.

Hartman, P. : Topologisation of projective planes by epimorphisms.

Herzer, A. : Projective representations of low dimensions for chain geometrics.

Kirezci, M. : The embedding problem of non IBN rings $V_{n,m}$

Knarr, N. : The topology of the classical Hjelmslev plane.

Samaga, H.J. : On optimal saturated sets in Galois geometries.

Schlichting, G. : Group representations and polynomial idendities.

Siemons, J. : Steiner systems whose automorphism group 2—homogeneus.

Törner, G. : Construction method for nearly simple Hjelmslev rings.

Ülküdaş, M. : Construction of loci in Boolean geometry.

Völklein, H. : Flag transitive linear groups, Bezout rings and the condition of free mobility.

Problem Session.

NEARRINGS AND NONCOMMUTATIVE GEOMETRY

J. Andre

If R is a ring with 1 and $V = R^n$ a free R—module then $U : V^2 \longrightarrow p\ V$, $(x, y) \longrightarrow x\ U\ y := x + R(y-x)$ defines a commutative operator U on V (cf. e.g. H.J. Arnold: Die Geometrie der Ringe im Rahmen allgemeiner affiner Strukturen, Göttingen, 1971). For a nearring (i.e. only the distributive law $a(b+c) = ab + ac$ holds but not necessarily the other one), however, this operation is not commutative in general. Hence, nearrings lead to so called noncommutative spaces which will be investigated in this talk. Especially some connections between algebraic properties of nearrings and geometric properties of the spaces generated by them will be established. Some results of E. Theobald and H. Ney are used.

representation λ of G on $L^2(X, \mu)$, μ a quasiinvariant measure on X and suppose a satisfies a standard polynomial identity of degree n

$$(P_n) : \sum_{\sigma \in S_n} \mathrm{Sig}\,\sigma A_{\sigma 1} \ldots A_{\sigma n} = 0 \text{ for all } A_1, \ldots, A_n \in a$$

then $\lambda(g)$ is abelian by finite.

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REMARKS ON NEARLY SIMPLE HJELISLEV RINGS

G. Törner

The classification of finite projective Hjelmslev planes in respect to their levels or types (height...) has turned out to be a useful description [1]. In the desarguesian, not necessarily finite case these levels correspond to two—sided ideals in the Hjelmslev—ring as the coordinate ring. A not necessarily commutative ring with 1 is called Hjelmslev ring if each nonunit is a two—sided zero—divisor and the left resp. right ideals are linearly orded by inclusion. Rings satisfying the last conditions are often called chain rings. With this terminology the well—known uniform desarguesian Hjelmslev planes can be described by Hjelmslev rings R of type 2, namely R possesses exactly two two—sided ideals: J = the Jacobson radical with $J^2 = (0)$ and the zero—ideal. For a long time the question was open if there exist rings of that structure, however with $J^2 = J$. A related problem was posed in a module classification by OSOFSKY [2].

Essential in both situations was the question whether in chain rings there exist prime ideals which are not completely prime. Recently DUBROVIN [3,4] constructed examples of the type above.

In the talk a survey on the ideas of these contructions and several improvements are given. Further, the ideal neighbourhood of non completely prime prime ideals is analyzed.

References

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