The 24th PNU-POSTECH Algebraic Combinatorics Workshop

Organized by M.Hirasaka and J.Koolen

8th f March in 2008

Date

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Place

C32-209, Department of Mathematics in Pusan National University
Program

> 11:00-11:50, Seiya Negami (Yokohama National University)
> Distinguishing number of graphs with topological aspect

> 14:00-14:50, Atsuhiro Nakamoto (Yokohama National University) Dominating sets in triangulations on surfaces

> 15:00-15:50, Sho Matsumoto (Kyushu University)
> Hyperdeterminants and Jack polynomials

> 16:10-17:00, Sejeong Bang (Pusan National University)
> The Bannai-Ito Conjecture (III)

> 17:10-18:00, Jack Koolen (POSTECH)
> The Bannai-Ito Conjecture (IV)

> 19:00-21:00, Banquet (free of charge)

Available Devices for Presentation

We strongly encourage speakers to give a classical styled talk with chalk and blackboard. However, one beam projector is equipped at C32-209.

Important Remark In principle, each participant has to give comments or questions at least twice during the seminar.

Speaker: Seiya Negami (Yokohama National University)
Title: Distinguishing number of graphs with topological aspect
Abstract: Let G be a graph and $c : V(G) \rightarrow \{1, 2, ..., d\}$ an assignment of labels. Then the set of automorphisms preserving the labels of vertices given by c forms a subgroup in the automorphism group Aut(G) of G. If this subgroup consists only of the identity, then c is called a d-distinguishing labeling. A graph G is said to be d-distinguishable if it admits a d-distinguishing labeling. The distinguishing number of G is de?ned as the minimum number d such that G is d-distinguishable and is denoted by D(G). Although this nottion has been defined for astract graphs, we consider it, making some connection to re-embedding theory of graphs on surfaces. In particular, we can prove that every 3-connected planar graph is 2-distinguishable with very few exceptions and discuss upper bounds for distinguishing numbers of triangulations on closed surfaces.

Speaker: Atsuhiro Nakamoto (Yokohama National University)
Title: Dominating sets in triangulations on surfaces
Abstract: Let G be a graph and let $S \subseteq V(G)$. We say that S is dominating in G if each vertex of G is in S or adjacent to a vertex in S. We show that every triangulation G on the torus and the Klein bottle with n vertices has a dominating set of cardinality at most $n/3$. Moreover, we show the same conclusion holds for a triangulation on any non-spherical surface with su ÿciently large representativity. These results generalize the result by Matheson and Tarjan, and prove the conjectures by Plummer and Zha.

Speaker: Sho Matsumoto (Kyushu University)
Title: Hyperdeterminants and Jack polynomials
Abstract: We study a hyperdeterminant, which is a generalization of the determinant for high dimensional arrays. Our aim is to obtain a hyperdeterminantal expression for Jack polynomial associated with rectangular-shaped Young digrams. Jack polynomials are one-parameter extension of Schur polynomials. Schur polynomials have a beautiful determinantal expression, called Jacobi-Trudi formula. Our result is a generalization of Jacobi-Trudi formula to Jack polynomials.

Speaker: Sejeong Bang (Pusan National University)
Title: The Bannai-Ito Conjecture (I)
Abstract: In their book "Algebraic Combinatorics I: Association Schemes (1984)", Bannai and Ito conjectured that there are finitely many

distance-regular graphs with fixed valency at least three. In these two talks, we will show that the Bannai-Ito conjecture holds.

Speaker: Jack Koolen (POSTECH)
Title: The Bannai-Ito Conjecture (II)
Abstract: In their book "Algebraic Combinatorics I: Association Schemes (1984)", Bannai and Ito conjectured that there are finitely many distance-regular graphs with ?xed valency at least three. In these two talks, we will show that the Bannai-Ito conjecture holds.