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Group 3 :

### Generalized hecke operator

- Speaker : Kyeongseok Min (AORC)

- Abstract : Let  $\Gamma := N + S$  be of genus zero. Then there is a hauptmodul that satisfies a nice formula, called  $p$ -plication formula. From this, we can define the generalized hecke operator. Recently, Daeyeol Jeon, Soon-Yi Kang and Chang Heon Kim extended this result for the case of genus of  $\Gamma > 0$ .

In this talk, we introduce the property of generalized hecke operator including the case  $i\infty$  is a weierstrass point.

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## AORC Monthly Seminar

May 26 (Fri), 2023 @ AORC Seminar Room

# AORC Monthly Seminar

- Object : Active collaboration within and between groups, fitting the aim of SRC
- Plan : Newly-joined researchers take pivotal roles.
- Operations Committee :
  - Woocheol Choi (Committee Chair)
  - Bumtlee Kang (Group 1), Juyoung Jeong (Group 2), Bomi Shin (Group 3)

## Program

- 2:00 - 2:50 pm : Hojin Chu (Group 1) & discussion
- 3:00 - 3:50 pm : Kyeongseok Min (Group 3) & discussion
- 4:00 - 4:50 pm : Donghyun Kim (Group 1) & discussion

## Abstracts

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Group 1 :

### **The Friendship Theorem in a digraph version**

- Speaker : Hojin Chu (Seoul National University)
- Abstract : The Friendship Theorem states that if in a party any pair of persons has precisely one common friend, then there is always a person who is everybody's friend and the theorem has been proved by Paul Erdős, Alfréd Rényi, and Vera T. Sós in 1966. Our paper was prompted by the question 'What happens when the hypothesis that any pair of persons has precisely one common friend is replaced with the one that any pair of persons warms to precisely one person?' We call a digraph obtained in this way a friendship digraph. It is easy to check that a symmetric friendship digraph becomes a friendship graph if each two cycle is replaced with an edge. Based on this observation, one can say that a friendship digraph is a generalization of a friendship graph. In this paper, we present a digraph version of friendship theorem by characterizing friendship digraphs in which any two distinct vertices share exactly one out-neighbor and provide a sufficient and necessary condition for the existence of friendship digraphs.

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Group 1 :

### **Combinatorics of the modified labeled Dyck paths**

- Speaker : Donghyun Kim (Seoul National University)
- Abstract : Modified labeled Dyck paths are combinatorial objects that are in bijection with parking functions. In this talk, we explore bounce and area statistics on modified labeled Dyck paths and how they were used to give a famous Shuffle formula. We also explain our new feminonic formula which we named the lightning bolt formula. If time permits, we relate the lightning bolt formula with the Science Fiction conjecture for Macdonald polynomials.  
Based on joint work with Seung Jin Lee and Jaeseong Oh.