

# Group, Algebra, Language and Related Areas in Computer Science

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The Kyoto University Research Institute for Mathematical Science (RIMS) workshop  
"Group, Algebra, Language and Related Areas in Computer Science"  
will be held as follows:



**Period: 2024-02-14 – 2024-02-16**

**Room 111**

Research Institute for Mathematical Sciences  
Kyoto University, Kyoto 606-8502, Japan

## Program

### ■ Feb. 14 (Wednesday)

**9:20– 9:50** Honda Rina, Fujita Kenetsu Gunma University  
Boolos' "The Hardest Logic Puzzle Ever" and Logical Reasoning

**9:50–10:20** Shuji Jimbo Okayama University  
Optimum solution search for FreeCell by applying strongly connected component decomposition algorithm for directed graphs

### Break

**10:30–11:00** Noriaki Kamiya University of Aizu  
On the title "Lie algebra" of books published in Japan

**11:00–11:50** **Invited Talk**  
Songpon Sriwongsa King Mongkut's University of Technology Thonburi  
Orthogonal decomposition problem for modular Lie algebras

### Lunch Break

**13:10–13:40** Satoshi Yamanaka National Institute of Technology, Tsuyama  
On Galois polynomials of Artin-Schreier type in skew polynomial rings

**13:40–14:10** Hisaya Tsutsui Embry-Riddle Aeronautical University  
Super Prime Modules

**14:10–14:40** Yuji Kobayashi Laboratory of Mathematics and Games  
Automorphism groups of zeropotent algebras of dimension 3

### Break

**14:50–15:40** **Invited Talk**  
Kenzi Satô Tamagawa University  
Around the Banach-Tarski paradox

**15:40–16:10** Kumazawa Masaaki Mino Gakuen High School  
BCK-algebra in the beginning

**16:10–16:40** Jiryo Komeda Kanagawa Institute of Technology  
On numerical semigroups generated by 5 elements whose quotients by 2 are non-symmetric

### ■ Feb. 15 (Thursday)

**9:20– 9:50** Tomoki Uchimura Keio University  
Introduction of inverse correspondences between inverse semigroups,  
and a categorical approach to inverse semigroups

**9:50–10:20** Haruki Fukaura Akita University  
Latin Hexahedra of Small Order

### Break

**10:30–11:00** Igor Potapov University of Liverpool  
Reachability problems in linear maps and matrix semigroups

**11:00–11:50** **Invited Talk**  
Akitoshi Kawamura Kyoto University  
Scheduling recurring tasks with frequency requirements

- Lunch Break**  
**13:20–13:50** Attila Egri-Nagy Akita International University  
Hierarchical Decompositions of Semigroups - Back to the Basics
- 13:50–14:40** **Invited Talk**  
Paul Hriljac Embry-Riddle Aeronautical University  
Some NP complete problems based on algebra and algebraic geometry over finite fields
- Break**  
**14:50–15:20** Marcin J. Schroeder Akita International University  
Levels of Abstraction of Information
- 15:20–15:50** Carl-Fredrik Nyberg Brodda KIAS  
The freeness problem for parabolic subgroups of  $SL(2, Q)$
- 15:50–16:40** **Invited Talk**  
Collin Bleak University of St Andrews  
On classes of groups defined by classes of formal languages
- 18:30–** **Banquet**
- **Feb. 16 (Friday)**
- 9:20– 9:50** Szilard Zsolt Fazekas Akita University  
Sweep complexity of one-way jumping automata
- 9:50–10:20** Géza Horváth Unniversity of Debrecen  
The Advantages of Automata-Based Stream Ciphers over Classical Ones
- Break**  
**10:30–11:00** Weiguo Xie, Andrew Bowling University of Minnesota - Duluth  
A Novel Systematic Rotation Method to Color Planar Graphs
- 11:00–11:50** **Invited Talk**  
Tatsunari Watanabe Embry-Riddle Aeronautical University  
The Birman exact sequence for the hyperelliptic mapping class group
- Lunch Break**  
**13:20–13:50** Huang Xinhao, Szilard Fazekas Akita University  
Parikh Factors Matrix
- 13:50–14:20** Akihiro Yamamura Akita University  
Entringer family of permutations determined by Parikh matrices
- 14:20–14:50** Machida Hajime Hitotsubashi University  
Orderly majority functions and minimal clones
- Break**  
**15:00–15:30** Tomoko Adachi Shizuoka Institute of Science and Technology  
Classical construction of Latin squares and their characteristic
- 15:30–15:50** Yusuke Miura, Tatsuya Maruta Osaka Metropolitan University  
On the minimal 2-blocking sets in  $PG(5, 2)$
- 15:50–16:20** Yoshiyuki Kunimochi Shizuoka Institute of Science and Technology  
Strong codes and their syntactic monoids
- 16:20–16:50** Bakh Khoussainov The University of Electronic Science and Technology of China(UESTC)  
Automatic word structures