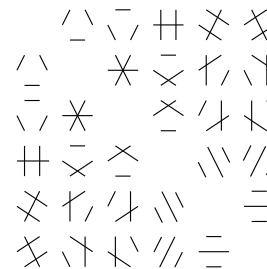


# Mathematics Seminar



## Rocky Mountain Algebraic Combinatorics Seminar

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### Constructive Membership Tests in Some Infinite Matrix Groups

Alexander Hulpke  
Colorado State University

We describe algorithms and heuristics that allow us to express arbitrary elements of  $SL_n(\mathbb{Z})$  and  $Sp_{2n}(\mathbb{Z})$  as products of generators in particular “standard” generating sets. For elements obtained experimentally as random products, it produces product expressions whose lengths are competitive with the input lengths.

### Subregular $J$ -rings of Coxeter systems as quotients of path algebras

Tianjuan Xu  
University of Colorado, Boulder

The asymptotic Hecke algebra, or  $J$ -ring, of a Coxeter system is an associative algebra closely related to the Hecke algebra of the system. We study a subalgebra  $J_C$  of  $J$  which has a natural basis indexed by the rigid elements of the Coxeter group, where “rigid” means having a unique reduced word. Exploiting the rigidity property, we show that  $J_C$  can be realized as a certain quotient of the path algebra of the double quiver of the Coxeter diagram of the system. This allows us to use quiver representations to answer representation-theoretical questions about  $J_C$ , such as when  $J_C$  is semisimple, in terms of graph-theoretical properties of the Coxeter diagram.

Weber 223  
4–6 pm, Friday, Sep 27, 2019  
(Refreshments in Weber 117, 3:30–4 pm)  
Colorado State University

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This is a joint Denver U / UC Boulder / UC Denver / U of Wyoming / CSU seminar that meets biweekly.  
Anyone interested is welcome to join us at a local restaurant for dinner after the talks.



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