1023-05-1097 **Nathan Reading*** (nathan_reading@ncsu.edu), Department of Mathematics, Harrelson Hall 225, Box 8205, NCSU Campus, Raleigh, NC 27695-8205. *Lattice theory of the poset of regions, with applications to W-Catalan combinatorics.*

I will outline a construction which, starting with a lattice congruence on the poset of regions of a simplicial hyperplane arrangement $\mathcal{A}$, defines a coarsening of the fan defined by $\mathcal{A}$. In the motivating special case of a Coxeter arrangement, the poset of regions is the weak order on the corresponding Coxeter group. For a particular choice of lattice congruence, the coarsening procedure constructs the Cambrian fan, whose maximal cones are counted by the "W-Catalan number" (a generalization the usual Catalan number.) The Cambrian fan is combinatorially isomorphic to the fan dual to the generalized associahedron. Thus in particular the combinatorial backbone of cluster algebras of finite type can be constructed directly from the lattice theory of the weak order.

The talk will be introductory. I will give relevant definitions, examples and some statements of (or allusions to) main results. Many of the results on the Cambrian fan are joint with David Speyer. (Received September 25, 2006)