1. Type A Multiple Dirichlet Series p-parts have 2 descriptions:

- Crystal Graph (Gelfand-Tsetlin Patterns)
- Averaging Description (Weyl Group)

We know they coincide since both agree with Whittaker functions on metaplectic groups. Can this equivalence be shown directly?

2. Crystal graph descriptions for other types, e.g. could one encode p-parts using statistics derived from MV polytopes? What is a crystal description for G_2?

3. Bump and Nakasuji have conjectural relative Gindikin-Karpelevich formula for pairs $u, v \in W$ such that $P_{u,v} = 1$. Make a conjecture for general u, v. Also the purely combinatorial conjectures that are stated in the paper.

4. Investigate combinatorial models for Iwahori fixed vectors in the Whittaker model. Already interesting for non-metaplectic case. See papers of Reeder. Initial idea (Ram): use alcove walk model.

5. See if Weyl group multiple Dirichlet series methods are useful for zeta functions of prehomogeneous vector spaces in several complex variables. Example: take $\mathrm{GL}_2(K)\times\mathrm{GL}_1(K)$ acting on $K^3 \oplus K^2$ by $\mathrm{sym}^2 \oplus (\mathrm{std} \otimes \mathrm{homothety})$. Then the associated zeta function is the A_2 quadratic double Dirichlet series. (Shintani.) This gives a different way of getting the analytic properties of the A_2 quadratic double Dirichlet series. This can be used to count binary quadratic forms or quadratic orders. There is also a cubic example – what do its specializations count?

6. (Goldfeld) Investigate Whittaker models occurring in metaplectic Eisenstein series induced from cusp forms on Levi subgroups.

7. (Patterson) Even on GL_2 where the Shimura correspondence is known for higher covers (Flicker), the Fourier coefficients are completely mysterious. Is there an analog of Waldspurger's theorem? L. Möhring's 2003 Göttingen dissertation has extended tablesof coefficients. Investigate Fourier coefficients of cusp forms of exceptional and nonexceptional cusp forms. One idea when $n = 3$: there is a dual pair $\mathrm{SL}_2 \times \mathrm{SL}_2$ inside of G_2 that effects the Shimura lift. What can one do with this? Can one draw any inference from Eisenstein series? (Hoffstein) The 3-cover of GL_3 might be a more natural place to start. We get some inspiration from Eisenstein series in this case? See Hoffstein's CRM Survey paper (1992) for some ideas.

8. We have some examples of multiple Dirichlet series whose groups of functional equations are affine Weyl groups. Are these Whittaker functions of

Eisenstein series on loop groups? Zhu constructed metaplectic double covers of loop groups.

9. Kamnitzer: Develop more of the combinatorics of crystals for affine Lie algebras. We have Lusztig data, string data, etc. for finite crystals. But in the affine case, these are less well understood. Berenstein: Nakashima, Zelevinsky. Brubaker: This paper contains conjectures. Schilling: using Kyoto path model you can do some things. Kamnitzer: But MV polytope pictures, Lusztig data pictures, things need to be clarified.

10. Ram: relate Macdonald polynomials solidly to Whittaker functions. One precise statement: is the Macdonald polynomial function a spherical function for the double loop group?

11. Savin: Langlands parametrization for metaplectic groups? Langlands mentioned importance of quasi-split case. An interesting case to work out is $\mathrm{SL}_3^{(3)}$ (trace formula) and $\mathrm{PGL}_3^{(3)}$ and $\mathrm{PD}^\times$. Marty Weissman has recent work on tori. Patterson: $\mathrm{SL}_r^{(2)}$ or $\mathrm{GL}_r^{(2)}$. Savin: Vogan packets. Work of Adams for real groups is a good starting point.

12 and 12_q: Real picture: is there any connection between real Whittaker functions and crystals? Oda-Hirano, Gerasimov-Lebedev-Oblezin. Oblezin: for quantum Whittaker functions the story is absolutely doable ... Demazure character ... it's done for type A (GLO) but not other Cartan types. For real Whittaker functions (nonquantum) less clear.

13. A beautiful conjecture of Wallach: when you define a global automorphic form, it is smooth, K-finite, $\mathcal{Z}$-finite and has moderate growth. If the rank is > 1, the condition of moderate growth can be dropped. Savin: Wallach can prove this. Goldfeld: no, he can't. Bump: is this related to results of Goodman and Wallach? Goodman: not directly. Kontorovich: maybe it's Property T. Start with a rank one group satisfying Property T. (Quaternionic unitary groups.) Can you drop moderate growth? A counterexample might be useful for building Poincaré series?