DETAILED SCHEDULE - STANFORD NUMBER THEORY LEARNING SEMINAR 2013 ON SHIMURA VARIETIES

Lectures 1, 2: Variation of Hodge structure **[Dan Litt]**

Example of curves. Review of Hodge theory for compact Kähler manifolds. Variations of Hodge structure.

References: Katz–Oda, Voisin *Hodge theory and complex algebraic geometry I*, Chapters 5–10.

Lecture 3: Period domains and the period mapping **[AV]**.

Lectures 4,5: Hermitian symmetric spaces **[Brandon Levin]**

Complex structures on G/K, the Harish–Chandra embedding, and examples: Sp_{2g} and $\mathrm{SO}_{n,2}$.

Reference: §5 of Brian's notes.

Lecture 6: Shimura datum and Shimura varieties **[Martin Luu]**

Definition of a Shimura datum, definition of "connected Shimura variety" over $\mathbf{C}$. Examples and non-examples.

Reference: Chapter 4 of Milne, §5 - 6 of Brian's handout.

Lecture 7: $\mathcal{A}_{g,n,d}$ over $\mathbb{Q}$ **[Rebecca Bellovin]**

Define moduli problem and sketch construction of $\mathcal{A}_{g,n,d}$ over $\mathbb{Q}$.

Reference: Chapters 3,6 of Mumford GIT.

Lecture 8: Compatibility with analytic moduli and CM-points **[Arnav Tripathy]**

Show compability between algebraic and analytic moduli. Apply main theorem of CM from last year to prove the analytic recipe for the Galois action on CM-points.

Reference: Discuss with Brian.

Lecture 9: Baily-Borel **[Mike Lipnowski]**

Explain existence and uniqueness of algebraic structure (over $\mathbb{C}$) on Shimura varieties.

References: Borel, *Some metric properties of arithmetic quotients of symmetric spaces and an extension theorem.* Baily–Borel, Milne Chapter 3.

Lecture 10: Adelic point of view **[Sam Lichtenstein]**

References: Chapter 5 of Milne; also §1–3 of Deligne.

Lecture 11: Special points and examples. **[Akshay Venkatesh]**

Lecture 12: Statement of Deligne's theorem. **[Brian Conrad]**