**18.727, Topics in Algebraic Geometry (rigid analytic geometry)**
**Kiran S. Kedlaya, fall 2004**
**List of potential topics (updated 23 Sep 04)**

Here is a list of topics I could speak about later in the course; feedback on these will help me decide what to cover. (I would also welcome additional suggestions.) Thanks in advance!

- $p$-adic cohomology (Berthelot, Grosse-Klönne, Kedlaya, Monsky-Washnitzer): overconvergent de Rham cohomology, Monsky-Washnitzer cohomology, rigid cohomology, computational applications ("Kedlaya's algorithm") [FvdP, Chapter 7]
- Lubin-Tate formal groups (Gross-Hopkins): period mapping on the moduli space, relationship to $p$-adic Hodge theory [GrH1], [GrH2].
- Modular forms (Coleman, Coleman-Mazur): overconvergent modular forms, the "eigencurve", Coleman's interpretation of the stable model of $X_0(p^2)$ [Col]. If we cover this topic, I may ask Frank Calegari to give some guest lectures (he has preliminarily agreed to do so); if not, I may do it in my graduate seminar.
- $p$-adic uniformization of symmetric spaces: Cherednik-Drinfeld, applications to the weight-monodromy conjecture (de Shalit, Ito).
- Reduction of curves and abelian varieties: stable reduction, Mumford curves, Néron models [FvdP, Chapter 5].
- Abhyankar's conjecture (Harbater, Raynaud) [FvdP, Chapter 9].

# References


[Col] R.F. Coleman, On the components of $X_0(p^n)$, preprint available at `math.berkeley.edu/~coleman/stable/stable-Components.ps`.

[FvdP] J. Fresnel and M. van der Put, *Rigid analytic geometry and its applications*, Progress in Mathematics, 218, Birkhäuser (Boston), 2004.

[GrH1] B.H. Gross and M.J. Hopkins, The rigid analytic period mapping, Lubin-Tate space, and stable homotopy theory, *Bull. Amer. Math. Soc. (N.S.)* **30** (1994), 76–86.

[GrH2] B.H. Gross and M.J. Hopkins, Equivariant vector bundles on the Lubin-Tate moduli space, *Topology and representation theory (Evanston, IL, 1992)*, Contemp. Math., 158, Amer. Math. Soc., (Providence), 1994, 23–88.