de Jong's Theory of Alterations
(Working Seminar)

The purpose of this working-seminar is to understand de Jong's work on resolution of singularities via alterations.

We plan to have 5 lectures in the Spring of 2004 which cover, roughly, the following topics.

Lectures 1 and 2: Introduction to Blow-ups. Convenient references are the sections concerning blow-ups in the books by Hartshorne [Ha] and Eisenbud-Harris [EH].

Lectures 3-5: Statement and sketch of proof of de Jong's main theorem in [deJ1], as well as some applications.

What to read

The most introductory account is Oort's article in the Bulletin of the AMS (see below).

de Jong's two main papers on alterations:

[deJ1] A.J. de Jong, *Smoothness, Semi-stability and Alterations*, Publ. Math. IHES **83**, (1996) 51-93.

[deJ2] A.J. de Jong, *Families of curves and alterations*, Ann. Inst. Fourier **47**, (1997) 599-621.

Note: Both may be found on de Jong's homepage: www-math.mit.edu/ dejong/.

Some survey articles about de Jong's work:

[Be] P. Berthelot, *Alterations de varietes algebriques*, Seminaire BOURBAKI, 48eme annee, 1995-96, no. 815.

[Oo] F. Oort, *Alterations can remove singularities*, Bull. Amer. Math. Soc. **35**, no. 4 (1998), 319-331.

Note: This can be found found on the AMS webpage, by clicking on Journals.

[AO] D. Abramovich, F. Oort, *Alterations and resolution of singularities*, In: Resolution of Singularities: a research textbook in honor of Oscar Zariski, Prog. in Math. **181**, Birhauser (200), pp. 339-108.

References

[EH] D. Eisenbud, J. Harris, *The Geometry of Schemes*, Springer GTM **197** (2000).

[Ha] R. Hartshorne, *Algebraic Geometry*, Springer GTM **52** (1977).