ANABELAIN GEOMETRY

JUAN SERRATOS

Contents

1. Introduction

The purpose of this note is to make an introduction to *anabelian geometry* to myself, and possibly the reader. Something often first mentioned when hearing the word "anabelian" is why not just use the word "non-abelian" or "non-commutative" and this correspondence is somewhat of a mistake. That is, anabelian refers to something else. The idea often mentioned, I believe attributed to Grothendieck, is that the less abelian $\pi_1^{\text{ét}}(X, x)$ is, then the more information it will have about X, and the term *anabelian* alludes to this idea. There are special varieties, called *anabelian varieties*, whose isomorphism class is entirely determined by $\pi_1^{\text{ét}}(X, x)$. The most well-known paper, I believe, written about this anabelian idea is Grothendieck's "Esquisse d'un programme" [Gro84] and Grothendieck first communicated the idea to Faltings in a letter [Gro83].

2. Review of Étale Cohomology

References

[Gro83] Alexander Grothendieck. Letter to faltings. https://webusers.imj-prg.fr/~leila.schneps/grothendieckcircle/Letters/GtoF.pdf, 1983. Accessed: Date.
[Gro84] Alexander Grothendieck. Esquisse d'un programme. https://webusers.imj-prg.fr/~leila.schneps/grothendieckcircle/EsquisseFr.pdf, 1984.