Cohomological aspects of non abelian Hodge theory for curves in positive characteristic by M.M.A. de Cataldo

November 3, 2021

The course will be held from 7th March to 18 March and will consist of 4 lectures, each of 2 hours for a total of 8 hours.

Program:

1. Summary of non abelian Hodge theory over the complex field.
2. Introduction to the $P = W$ conjecture.
3. Flat connections on vector bundle over curves.
4. Moduli space of Higgs bundles and de Rham Moduli space of flat connections in positive characteristic.
5. Hitchin morphism (Higgs bundles).
6. p-Hitchin morphism (connections).
7. Hodge morphism (t-connections).
8. Cohomological version of non abelian Hodge theory for curves in positive characteristic via the Hodge morphism.
9. Local étale equivalence between Higgs in degree d and de Rham in degree pd.
10. p-multiplicativity.
11. Cohomological results via lifting and specialization.

Bibliographical references

https://arxiv.org/pdf/math/0008238.pdf, Laszlo-Pauly.
https://arxiv.org/pdf/1201.0741.pdf, Groechenig.
https://arxiv.org/pdf/2104.12970.pdf, de Cataldo-Zhang.