

CV date 2021-11-10

Part A. PERSONAL INFORMATION

First name	Guillermo		
Family name	Gallego		
Gender	Male	Birth date	1995-07-21
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A.1. Current position

University/Institution	Universidad Complutense de Madrid
Department/Center	Facultad de Ciencias Matemáticas - ICMAT
Advisor	Oscar García-Prada

A.2. Education

Degree/Master	University	Year
Degree in Mathematics	Universidad Complutense de Madrid	2018
Degree in Physics	Universidad Complutense de Madrid	2018
Master in Advanced Mathematics	Universidad Complutense de Madrid	2019
Master in Teacher's Training	Universidad Complutense de Madrid	2020

Part B. CV SUMMARY

My research lies within the field of algebraic and differential geometry, mainly over the field of complex numbers. My main research interest is the study of moduli problems of principal bundles with additional structure (for example, Higgs bundles and related objects). In my thesis I am studying several generalizations of the *Hitchin system*. In particular, I am working on two different generalizations.

The first one consists on considering objects similar to Higgs bundles, but where the twisting bundle can be any vector bundle, and not necessarily the cotangent bundle of the base variety. When the dimension of the base variety is 1 and the twisting is given by a line bundle, this topic has already been widely studied. I have been working in the case of dimension 1 and arbitrary twisting rank, centered specially in the case of rank 2. Some work in this direction is already available [1].

The second one consists on considering a “multiplicative version” of the Hitchin system, obtained from the multiplicative version of the Chevalley restriction theorem. This leads to the study of *multiplicative Higgs bundles*, which have already been considered in the literature. I am working on some problems regarding the action of the group of outer involutions of the structure group on the moduli space of these objects and its relation with Langlands duality.



Part C. RELEVANT SCIENTIFIC RESULTS

C.1. Publications.

[1] (with O. Garcia-Prada and M. S. Narasimhan), Higgs bundles twisted by a vector bundle, preprint arXiv:2105.05543. (2021)

C.2. Conferences and meetings

- Oxford-London Gauge Assembly (OLGA 2021). Poster and oral presentation: "Higgs bundles twisted by a vector bundle".
- 3rd "Bringing Young Mathematicians Together" Conference (BYMAT 2020). Oral presentation and proceedings article: "Universal spectral covers and the Hitchin map" (published in *TEMat monográficos, 2: Proceedings of the 3rd BYMAT Conference* (2021) 107-110).
- XIII Workshop of Young Researches in Mathematics (UCM, 2019). Oral presentation: "Higgs bundles twisted by a vector bundle".

C.3. Research projects

- Moduli spaces and gauge theory (Spanish Ministry of Science and Innovation). Principal Investigator: Oscar García-Prada. Code: PID2019-109339GB-C31.
- ICMAT Nigel Hitchin and Ngô Bảo Châu Laboratory.