

April 7, 2007

**ESF Exchange Grant  
SISSA, Trieste (March 7 to April 6, 2007)  
Scientific Report**

My visit at the International School for Advanced Studies in Trieste had the purpose of collaborating with Prof. Ugo Bruzzo and taking part in the seminar activity in the Mathematical Physics/Geometry group of the School.

During my stay I have studied the characterization of a class of semistable principal Higgs bundles on complex projective manifolds (those such that the corresponding adjoint bundles have vanishing second Chern class), showing that this class is entirely determined by the numerical effectiveness of some line bundle associated with parabolic subgroups of the structure group. These bundles enjoy several interesting properties (e.g., their restriction to every curve in the base manifold is semistable). These results will form the object of a paper to be jointly written with Prof. Bruzzo (the presumable title will be "Semistable principal Higgs bundles on complex projective manifolds").

I expect to further pursue this collaboration, since there are still many interesting questions to investigate, such as the relation with the existence of approximate Hermitian Yang-Mills structures, characterizations in terms of complete flag varieties, etc. At the moment I am continuing my visit at SISSA with funding provided by Istituto Nazionale di Alta Matematica. In any case I hope to be able to visit SISSA again, of which I have greatly enjoyed the stimulating atmosphere and perfect working conditions. Another great plus of the School is the possibility that it offers to attend seminars and lecture courses, of which I have taken advantage.

I believe that my stay at SISSA has been a very positive experience, very interesting and productive.

With best regards

Beatriz Graña Otero

