Research Networking Programmes

Short Visit Grant ☒ or Exchange Visit Grant ☐

(please tick the relevant box)

Scientific Report

The scientific report (WORD or PDF file – maximum of eight A4 pages) should be submitted online <u>within one month of the event</u>. It will be published on the ESF website.

Proposal Title: GESTA 2014 Summer School and b-symplectic collaborations

Application Reference N°: 6703

1)   Purpose of the visit

The purpose of my visit to ICMAT on June 2 to 6 was twofold: to attend and give a talk at the GESTA 2014 conference, and to meet with Prof. Eva Miranda and Dr. Geoff Scott, with whom I am collaborating on ongoing research projects.

2)   Description of the work carried out during the visit

I attended the GESTA 2014 conference, and on the last day gave a talk titled "Toric origami manifolds", which drew connections with both the mini-courses of Prof. Miguel Abreu and of Prof. Eva Miranda and Dr. Geoff Scott, as explained in the abstract for the talk:

In this talk we introduce a way (other than b-symplectic) in which symplectic forms degenerate along a hypersurface, we call it symplectic origami. We discuss the toric case, contrasting it with the classic case discussed in Abreu's mini-course and the b-symplectic case discussed in Miranda and Scott's mini-course. In particular we examine the topology of the manifolds that admit these structures and discuss how they sit in the larger context of topological analogues of toric symplectic manifolds.

Additionally, Prof. Eva Miranda, Dr. Geoff Scott and myself carried on discussions about a particular detail of the project that we are currently working on, concerning convexity results for torus actions on b-symplectic manifolds. This paper is a sequel of our previous paper "Toric actions on b-symplectic manifolds", extending its results to more general torus actions.

3)   Description of the main results obtained

In the work towards convexity results for torus actions on b-symplectic manifolds, we had previously studied the moment images in two extreme cases: the one in which the modular weights of the action on each of the connected components of the exceptional hypersurface is zero, and the one in which the modular weights of the action on each of the connected components of the exceptional hypersurface is nonzero. We have some indication (from examples) and believe that these are the only possible cases, and have been working on proving this claim. During our work sessions this week, we explored various possible paths to a proof, and tried to construct counterexamples. If indeed the claim is true, the how and why we fail to construct counterexamples might shed some light on how to prove the claim. We did not yet succeed in proving this claim.

4)   Future collaboration with host institution (if applicable)

Not applicable, since my host Prof. Eva Miranda was herself visiting ICMAT from her home institution UPC in Barcelona.

5)   **Projected publications / articles resulting or to result from the grant** *(ESF must be acknowledged in publications resulting from the grantee's work in relation with the grant)*

If we manage to prove the missing claim in argument, we will submit our results for publication in a paper titled "Convexity results for torus action on b-symplectic manifolds", in which we will acknowledge ESF and this particular CAST short visit grant.

6)   Other comments (if any)