

## ITC CONFERENCE GRANT SCIENTIFIC REPORT

This report is submitted for approval by the grantee to the MC Chair.

**Action number: CA15108**

**Conference title: The 14th International Workshop on the Dark Side of the Universe**

**Conference start and end date: 25/06/2018 to 29/06/2018**

**Conference attendance start and end date: 25/06/2018 to 29/06/2018**

**Grantee name: Christopher Eckner**

### ACTIVITIES DURING YOUR ATTENDANCE AT THIS CONFERENCE:

Starting from 25<sup>th</sup> June 2018 in Annecy-le-Vieux (France), the conference “Dark Side of the Universe” hosted almost one hundred invited and parallel talks proposing and highlighting ways to observe and detect dark matter as well as dark energy. I have attended those talks from 25<sup>th</sup> to 29<sup>th</sup> June.

I have submitted an abstract to the conference organisers with the intention to present the current status of an ongoing project connected to the ‘Cherenkov Telescope Array’ (CTA). The final aim of this projects is to determine the sensitivity of this instrument to (WIMP) dark matter annihilations in the centre of the Milky Way given the proposed survey strategy and state-of-the-art models for astrophysical sources of high-energy gamma-ray emission in the galaxy’s central region.

The submitted abstract was approved so that I eventually presented the preliminary results of the aforementioned project on 26<sup>th</sup> July during the conference. I received a couple of questions after the talk referring to the treatment of a specific astrophysical component, namely the Galactic diffuse emission. In the subsequent coffee break, I was able to discuss this matter with a scientist from the Fermi collaboration who performs a similar analysis with Fermi data in the Milky Way’s outer dark matter halo.

On 28<sup>th</sup> June, I had a discussion with Thomas Edwards (GRAPPA, University of Amsterdam) about a novel statistics tool called ‘Swordfish’ which enables to user to forecast limits, discovery reaches, etc. of astrophysical experiments based on the Fisher information matrix in an efficient and fast way. We want to include this tool in our dark matter project in order to perform a sensitivity forecast that takes into consideration the systematic uncertainties of the CTA as well as the astrophysical components in a physically-motivated manner. I had already visited him in March in Amsterdam and we were lucky to solve Swordfish-related problems during the course of the conference.

Apart from the scientific activities, I attended the reception evening and social dinner of the conference, as well as an excursion to Annecy, organised by the local host institution.

### IMPACT ON YOUR RESEARCH AND FUTURE COLLABORATIONS (if applicable)

Due to this conference, I was able to speak with Thomas Edwards in person so that we could solve my problems regarding the treatment of Swordfish together. Thus, I will able to extend the current scope of the CTA project to strengthen the message it is supposed to convey.

