**IceCube Institutional Memorandum Of Understanding (MOU)**

**Scope Of Work**

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| **University of Alberta****Darren Grant****Ph.D Scientists** (Faculty Scientist/Post Doc Grads) : **1** (1 0 2) |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Labor Cat.** | **Names** | **WBS L3** | **Tasks** | **WBS 2.1** | **WBS 2.2** | **WBS 2.3** | **WBS 2.4** | **WBS 2.5** | **Grand Total** |
| Program Management | Detector Maintenance & Operations | Computing & Data Management | Triggering & Filtering | Data Quality, Reconstruction & Simulation Tools |
| KE | GRANT, DARREN | Reconstruction/ Analysis tools | Maintenance of IceCube-Photonics interface |  |  |  |  | 0.10 | 0.10 |
|  | Simulation Production | WestGrid computing |  |  | 0.10 |  |  | 0.10 |
|  |  | Administration | PubComm adjoint member  | 0.10 |  |  |  |  | 0.10 |
|  |  | Physics Filters | Low-energy WG Co-Chair |  |  |  | 0.25 |  | 0.25 |
|  |  | Engineering and R&D support  | Lead scientist for PINGU | 0.10 |  |  |  |  | 0.10 |
|  |  | TFT Coordination | TFT Board Member |  |  |  | 0.10 |  | 0.10 |
|  | **GRANT, DARREN Total** |  | **0.20** |  | **0.10** | **0.35** | **0.10** | **0.75** |
| PO | ALBERTA, PO | Reconstruction/ Analysis tools | Maintenance of IceCube-Photonics interface |  |  |  |  | 0.00 | 0.00 |
|  | **ALBERTA, PO Total** |  |  |  |  |  | **0.00** | **0.00** |
| GR  | Nowicki, SarahWood, Tania | Simulation ProductionReconstruction/ Analysis tools | Clsim photon table productionCalibrations with LED and minimum ionizing muons |  |  | 0.35 |  | 0.35 | 0.350.35 |
|  | **WOOD, TANIA and NOWICKI, SARAH Total** |  |  |  | **0.35** |  | **0.35** | **0.70** |
| AD | ALBERTA, AD | Administration | Host the 2014 Spring Collaboration Meeting | 0.20 |  |  |  |  | 0.20 |
|  | **ALBERTA, AD Total** |  | **0.20** |  |  |  |  | **0.20** |
| **ALBERTA Total** |  |  | **0.40** |  | **0.45** | **0.35** | **0.45** | **1.65** |

**Faculty:**

Darren Grant

**Scientists and Post Docs:**

**Ph.D. Students:**

Tania Wood (PhD): Calibration working group (detector systematics with LEDs) (Analysis focus – WIMP dark matter)

Sarah Nowicki (PhD): Simulation production – WestGrid computing; muon table production. (Analysis focus – neutrino oscillations with DeepCore)

**Diploma/Master Students:**

**Undergraduates:** 4 summer students.

**Explanation:**

A Canadian Natural Science and Engineering Research Council (NSERC) Discovery Grant was awarded beginning April 1, 2013 for a period of 1 year to support IceCube-DeepCore analysis efforts at the University of Alberta and the University of Toronto. The level of support awarded includes 2 faculty, 2 graduate students and 4 undergraduate summer students. The 2014/15 NSERC award will be announced April 1 2014.

**Description of planned analysis:**

The Alberta group will focus on analyses involving data from DeepCore and physics feasibility studies for PINGU. Tania’s PhD thesis topic will be a GC WIMP search with DeepCore. Sarah Nowicki upgraded the PhD program in May 2014 and is currently working on the semi-infinite muon spline tables and simulation production on WestGrid. The undergraduates this summer will focus on proton decay feasibility in PINGU and MICA, a DeepCore angular reconstruction algorithm and a DeepCore energy estimator.

**Description of Service work**

In the past year we took the initial steps to establish WestGrid as an IceCube computing facility. With WestGrid we have already established the production for WIMP signal and SUSY model generation as well as the production of simulation for PINGU. We have implemented the extensive GPUs within WestGrid to bolster clsim production within the collaboration. I estimate the following service activity level for the local group of 1 faculty + 1 graduate student in the 2011/12 fiscal year.

**Other contributions**

In January 2012 I was appointed the IceCube Lead Scientist for Future Detector Upgrades. In March 2012 I am to take the role of co-convener for the low-energy channel working group. I estimate these responsibilities represent a 0.3 FTE time commitment to IceCube. This in addition to my roles on the TFT and Pubcomm boards. We are preparing and hosting the Spring collaboration meeting in Banff Alberta in March 2014.