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

**Scope of Work**

 **Massachusetts Institute of Technology**

**Janet M. Conrad**

**Ph.D Scientists** (Faculty Scientist/Post Doc Grads): **1** (1 0 2)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Labor Cat.** | **Names** | **WBS Level 3** | **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 | Janet M. Conrad | Engineering and R&D support  | Test beam development | 0.05 |   |   |   |   | 0.05 |
|  | Engineering and R&D support | IOM development | 0.05 |   |   |   |   | 0.05 |
|   | **Janet M. Conrad Total** |  | **0.10** |  |  |  |  | **0.10** |
| PO |  |  |  |   |  |   |   |   |  |
|   |   |  |  |   |   |   |   |  |  |
|   | **Postdoc Total** |  |  |  |  |  |  |  |
| GR | Gabriel H. Collin | Detector Calibration | Flasher code development |   | 0.10 |    |  |   |  |
|   |   | Simulation Programs | Atmospheric simulation |   |   |   |  | 0.50  |  |
|   | **Gabriel H. Collin Total**  |  |  | **0.10** |  |  |  **0.50** | **0.60** |
| GR | Benjamin J.P. Jones | Simulation Programs | Detector and earth model simulation – production and validation |   |  |   |   |  0.60  | 0.60 |
|   | **Benjamin J.P. Jones Total**  |  |  |  |  |  | **0.60** | **0.60** |
| **Institution Name Total** |  | **0.10** | **0.10** | **0.0** | **0.0** | **1.10** | **1.30** |

**Faculty:**

Janet M. Conrad – Institution lead, M&O responsibilities in R&D (2.1.2) including proposing a FNAL testbeam run at to constrain particle simulations for IceCube and PINGU and studying isolated optical modules (IOMs) for PINGU.

**Scientists and Post Docs:**

Plan is to hire a postdoc within the next 6 months.

**Grad Students:**

Ben Jones – M&O responsibility is in Data Quality, Reconstruction and Simulation (2.5.1), presently concentrating on 1) simulation code validation studies (NuGen vs NuFSGen, PPC vs CLSIM, and many other comparisons) 2) producing simulated data sets, and 3) parameterization for earth model systematics. Simulation work focuses largely on the 1 to 100 TeV range of data.

Analysis Topic: I86 sterile neutrino analysis in collaboration with U. Wisconsin.

Gabriel Collin – M&O responsibility in detector maintenance and operations (2.2.8) TBD in coordination with Dawn Williams, and will begin June 1, 2015. M&O responsibility in Data Quality, Reconstruction and Simulation (2.5.1.) is on 1) expanding the flux model of A. Fedynitch to include more atmospheric density data sets and 2) determining atmospheric systematics using errors on these data sets. Focus is in the 1-100 TeV range.

Analysis Topics: Seasonal variation of atmospheric flux