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

**Scope of Work**

**Yale University**

**Reina Maruyama**

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

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| **Labor Cat.** | **Names** | **WBS Level 3** | **Tasks** | **Funds Source** | **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 | Reina Maruyama | Supernova System | Supernova DAQ | Inst. In-Kind |  | 0.05 | |  | |  | |  | | 0.05 |
|  | Engineering and R&D Support | Gen2 R&D | Inst. In-Kind | 0.05 |  | |  | |  | |  | | 0.05 |
|  | Reconstruction / Analysis Tools | Coincident events between IceCube and DM-Ice, low energy reconstruction | Inst. In-Kind |  |  | |  | |  | | 0.05 | | 0.05 |
|  | **Reina Maruyama Total** | |  |  | **0.05** | **0.05** | |  | |  | | **0.05** | | **0.15** |
| PO | TBD | Reconstruction / Analysis Tools | Coincident events between IceCube and DM-Ice, low energy reconstruction |  |  |  | |  | |  | |  | |  |
|  | **Total** | |  |  |  |  | |  | |  | |  | |  |
| **Yale Total** | | |  |  | **0.05** | | **0.05** | |  | |  | | **0.05** | **0.15** |

**Faculty:**

Reina Maruyama – Supernova DAQ and Simulation tools, dark matter search, coincidence with DM-Ice

**Scientists and Post Docs:**

TBD – low-energy reconstruction

**Grad Students:**

**Overall summary of M&O responsibilities and analysis topics**

The PI is looking at coincidence events between DM-Ice and IceCube. The PI hopes to find a suitable postdoc to take this on. These coincident events offer opportunities for improving reconstruction, especially for low energy events, as well as threshold studies. The PI at Yale, Maruyama, will continue her work in supernova detection and explore synergies between IceCube and DM-Ice with Yale students and postdocs. Funding to supports this work will be sought from NSF and other sources.

**Gen-2 tasks:**

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| **Name** | **Task** | **FTE** |
| Reina Maruyama | Gen2 R&D | 0.05 |