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

**Scope of Work**

**University of Wisconsin – River Falls**

**Jim Madsen**

**Ph.D Scientists** (Faculty Scientist/Post Doc Grads): **3** (3 0 0)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Labor Cat.** | **Names** | **WBS L3** | **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 | MADSEN, JIM  | Education & Outreach | Associate Director for E&O | NSF M&O Core | 0.50 |  |  |  |  | 0.50 |
|  |  | Education & Outreach | Teachers’ program and UWRF Upward Bound | NSF M&O Core | 0.10 |   |   |   |   | 0.10 |
|   | Reconstruction/ Analysis tools | low-energy IceTop extensions | NSF M&O Core |   |   |   |   | 0.10 | 0.10 |
|   | **MADSEN, JIM Total** |  |  | **0.60** |  |  |  | **0.10** | **0.70** |
|  | Seunarine, Suruj | Physics Filters | Calibration-Flasher Studies | Inst In-Kind |  | 0.20 |   |  |   | 0.20 |
|  | Reconstruction/ Analysis tools | Low-Energy Extensions of IceTop | Inst In-Kind |  |  |  |  | 0.10 | 0.10 |
|   | **Seunarine, Suruj Total** |  |  |  | **0.20** |  |  | **0.10** | **0.30** |
| **UWRF Total** |  |  |  | **0.60** | **0.20** |  |  | **0.20** | **1.00** |

Additional Undergraduate Students Programs:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Labor Cat.** | **Names** | **WBS L3** | **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 |
| UG | UWRF UG | Detector Calibration | Detector Calibration | Inst In-Kind |  |  0.5 |  |  |  | 0.5 |
| UG | UWRF UG | Detector Calibration | Detector Calibration | Base Grant |  | 0.5 |  |  |  | 0.5 |
| UG | UWRF UG | Simulations Programs | Simulations Programs | Base Grant |  |  |  |  | 0.5 | 0.5 |
|   | **UWRF UG Total** |  |  |  | **1.0** |  |  | **0.5** | **1.5** |
| **UWRF Total** |  |  |  |  | **1.0** |  |  | **0.5** | **1.5** |

**Faculty:**

Jim Madsen (L,) - ICB, Institution lead, Education and Outreach including Teachers’ program and UWRF Upward Bound, Undergraduate research, Low-Energy Extensions of IceTop

Glenn Spiczak – Education and Outreach Astrophysics course, referee for publication committee

Suruj Seunarine – Undergraduate Research, Calibration-Flasher Studies, Low-Energy Extensions of IceTop.

**UWRF General M&O (non-science) IceCube Responsibilities and Contributions:**

UWRF Group’s major responsibilities and contributions towards maintenance and operations of the IceCube experiment include:

* Education and Outreach activities including intensive research experiences for undergraduates (NSF: IRES grant # 1356635, REU Grant # 1460752 and K-12 teachers (NSF PolarTREC), math and science enrichment for underrepresented groups in the UWRF Upward Bound Program, recruiting and training teachers who deploy to the South Pole in conjunction with PolarTREC, and serving as the point of contact for Antarctic Artist and Writers candidates and awardees associated with IceCube
* Low-energy extensions of IceTop in conjunction with neutron monitors
* Calibration-Flasher Studies