**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  | Administration | Speakers Comm. Chair | Inst In-Kind | 0.25 |   |   |   |   | 0.25 |
|  | Education & Outreach | Associate Director for E&O | NSF M&O Core | 0.25 |  |  |  |  | 0.25 |
|  | 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, Speakers Committee Chair, 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, IceCube Live features advisory committee

**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, and graduate level classes for in-service high school teachers featuring IceCube science
* Low-energy extensions of IceTop in conjunction with neutron monitors
* Calibration-Flasher Studies