**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** | **WBS 2.6** | **Grand Total** |
|  | Program Coordination | Detector Maintenance & Operations | Computing & Data Management | Data Processing & Simulation | Software | Calibration |
| KE | MADSEN, JIM | Education & Outreach | Associate Director for E&O | NSF M&O Core | 0.40 |  |  |  |  |  | 0.40 |
|  |  | Education & Outreach | Teachers’ program and UWRF Upward Bound | NSF M&O Core | 0.05 |  |  |  |  |  | 0.05 |
|  | Education & Outreach | Undergraduate Research | Inst In-Kind | 0.10 |  |  |  |  |  | 0.10 |
|  | **MADSEN, JIM Total** | |  |  | **0.55** |  |  |  |  |  | **0.55** |
|  | Seunarine, Suruj | Detector Calibration | Calibration-Flasher Studies | Inst In-Kind |  |  |  |  |  | 0.10 | 0.20 |
|  | Ice Properties | Calibration-Flasher Studies | Inst In-Kind |  |  |  |  |  | 0.10 |  |
|  | Reconstruction | Low-Energy Extensions of IceTop | Inst In-Kind |  |  |  |  | 0.10 |  | 0.10 |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  | **Seunarine, Suruj Total** | |  |  |  |  |  |  | **0.10** | **0.20** | **0.30** |
| **UWRF Total** | |  |  |  | **0.55** |  |  |  | **0.10** | **0.20** | **0.85** |

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** | **WBS 2.6** | **Grand Total** |
| Program Coordination | Detector Maintenance & Operations | Computing & Data Management | Data Processing & Simulation | Software | Calibration |
| 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 | Simulation Software | Simulations Programs | Base Grant |  |  |  |  | 0.5 |  | 0.5 |
|  | **UWRF UG Total** | |  |  |  |  |  |  | **0.5** | **1.0** | **1.5** |
| **UWRF Total** | |  |  |  |  |  |  |  | **0.5** | **1.0** | **1.5** |

**Faculty:**

Jim Madsen (L,) - ICB, Institution lead, Education and Outreach including Teachers’ program and UWRF Upward Bound, Undergraduate Research

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

Suruj Seunarine – Undergraduate Research, Calibration-Flasher Studies, Low-Energy Extensions of IceTop, IceCube Summer Software Boot Camp

**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 Renewal Pending, REU Grant # 175717 (Renewed for 2018-2020) 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