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

**Scope of Work**

**University of California, Berkeley**

**Buford Price**

**Ph.D Scientists** (Faculty Scientist/Post Doc Grads): **3** (1 2 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 | PRICE, BUFORD | Administration | Election Comm member | Inst. In-Kind | 0.10 |   |   |   |   | 0.10 |
|   | **PRICE, BUFORD Total** |  |  | **0.10** |  |  |  |  | **0.10** |
|   | FILIMONOV, KIRILL | Detector Monitoring | Coordinate Monitoring | Base Grant |   | 0.25 |   |   |   | 0.25 |
|   |  | Detector Monitoring | Coordinate Monitoring | NSF M&O Core |   | 0.25 |   |   |   | 0.25 |
|  |  | Administration | Pubcom member | Base Grant | 0.10 |   |   |   |   | 0.10 |
|   | **FILIMONOV, KIRILL Total** |  |  | **0.10** | **0.50** |  |  |  | **0.60** |
|   | UCB SC | Detector Monitoring | Monitoring shifts | Inst. In-Kind |   | 0.02 |   |   |   | 0.02 |
|   | **UCB SC Total** |  |  |  | **0.02** |  |  |  | **0.02** |
|   | WOSCHNAGG, KURT | Administration | Speakers Comm member | Base Grant | 0.10 |   |   |   |   | 0.10 |
|   |   | Detector Calibration | Ice Properties calibration | Base Grant |   | 0.15 |   |   |   | 0.15 |
|   |   | Physics Filters | Oscillations WG chair | Base Grant |   |   |   | 0.25 |   | 0.25 |
|   |   | Simulation Programs | Maintain and Verify Simulation of Photon Propagation and update Ice Properties | NSF M&O Core |   |   |   |   | 0.50 | 0.50 |
|   | **WOSCHNAGG, KURT Total** |  |  | **0.10** | **0.15** |  | **0.25** | **0.50** | **1.00** |
| **UCB Total** |  |  |  | **0.30** | **0.67** |  | **0.25** | **0.50** | **1.72** |

**Additional planned contribution**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 |
| GR | UCB GR | Detector Calibration | Calibration | Base Grant |   | 0.10 |   |   |   | 0.10 |
|   |  | Detector Monitoring | Monitoring shifts | Inst. In-Kind |   | 0.02 |   |   |   | 0.02 |
|   | **UCB GR Total** |  |  |  | **0.12** |  |  |  | **0.12** |

**Summary:**

The UC Berkeley group aims at making decisive contributions in three principal areas of analysis: searches for a neutrino signal from objects known in both space and time, searches for a diffuse neutrino flux from unresolved sources, and measurements of atmospheric neutrino oscillations. We will pursue the search for neutrinos coincident with core-collapse supernova explosions, and use very high-energy neutrinos from GRBs to search for Lorentz-invariance violation (LIV). We will analyze energies and arrival directions of atmospheric muon neutrinos to set limits on LIV parameters. In the diffuse analysis our work is focused on understanding/mitigating detector and simulation systematics to the high level required for an unambiguous detection of an astrophysical neutrino flux and for high-precision oscillation measurements. A major part of this is measurement of ice properties and simulation of photon propagation. Our service work is focused on calibration (low and high level) and detector monitoring.

**Faculty:**

Buford Price - Election Committee

**Scientists and Post Docs:**

Kurt Woschnagg - group lead, oscillations working group co-lead, ice properties,

 Speakers Committee, ICB

 Analysis topics: oscillations, diffuse analysis, systematics

Kirill Filimonov - detector monitoring framework and coordination, Pubcom member

 Analysis topics: GRB, cascades

**Ph.D. Students:**

TBDmonitoring, calibration

 Analysis topics: oscillations, systematics