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

**Scope of Work**

**South Dakota School of Mines and Technology**

**Xinhua Bai**

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Labor Cat.** | **Names** | **WBS Level 3** | **Tasks** | **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  | Xinhua Bai | 2.1.1 Administration | SDSMT Inst. Lead | 0.30 |  |  |  |  |  | 0.30 |
| 2.1.4 E&O | Education & Outreach for neutrino astronomy and IceCube | 0.10 |  |  |  |  |  | 0.10 |
| 2.2.4 Detector Monitoring | IceCube operation monitoring |  | 0.02 |  |  |  |  | 0.02 |
| 2.5.3/4 Reconstruction | Study of high energy cosmic rays, fluctuations  |  |  |  |  | 0.58 |  | 0.58 |
| **Bai, Xinhua Total** |  | **0.40** | **0.02** |  |  | **0.58** |  | **1.00** |
| GR2 | Diana Leon Silverio | 2.1.4 E&O | Education & Outreach for neutrino astronomy and IceCube | 0.05 |  |  |  |  |  | 0.05 |
| 2.2.4 Detector Monitoring | IceCube operation monitoring |  | 0.05 |  |  |  |  | 0.05 |
| 2.5.3 Reconstruction & physics analysis | Update and improve the IceTop-InIce combined reconstruction, study of fluctuations |  |  |  |  | 0.90 |  | 0.90 |
| **Diana Silverio Total**  |  | **0.05** | **0.05** |  |  | **0.90** |  | **1.00** |
| **South Dakota School of Mines & Technology Total** | **0.45** | **0.07** |  |  | **1.48** |  | **2.00** |

**Note:**

SDSMT personnel update: (1) PhD student Emily Dvorak graduated with PhD in May 2020. (2) Dr. Bai’s FTE is increased from 0.5 to 1.0. (3) Diana Leon Silverio (joined SDSMT since 08/2019) remains on the project.

SDSMT SoW update: We will focus on (i) the study of fluctuations, (ii) maintaining and improving the IceTop-InIce combined reconstruction, and (iii) investigating new scientific and technical opportunities with IceCube/Upgrade/Gen2, which may lead to new proposals. We will start the study of prompt muons in ultrahigh-energy cosmic ray events only if a new postdoc is funded.