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

**Scope of Work**

**Sungkyunkwan University**

**Carsten Rott**

**Ph.D Scientists** (Faculty Scientist/Post Doc Grads): **2** (1 1 5)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | ROTT, CARSTEN | Online Filter | BSM WG Co-Lead |  | 0.25  |   |  |   |  | 0.25 |
|  | Education & Outreach | Outreach | 0.05 |   |   |  |   |  | 0.05 |
|  |  | Administration | Speakers Comm member | 0.10 |  |  |  |  |  | 0.10 |
|   | **ROTT, CARSTEN Total** |  | **0.15** | **0.25** |  |  |  |  | **0.40** |  |
| PO | TOENNIS, CHRISTOPH  | Ice Properties | Photon tracking / ice-properties calibration |   |  |   |  |   | 0.20 | 0.20 |  |
|   |   | Engineering Support and R&D | Reconstruction tools  |  0.15 |  |   |  |  |  | 0.15 |  |
|  |  | Detector Monitoring | Detector Monitoring |  | 0.03 |  |  |  |  | 0.03 |  |
|   | **TOENNIS, CHRISTOPH Total** |  | **0.15** | **0.03** |  |  |  | **0.20** | **0.38** |  |
| GR | IN, SEONGJUN | Detector Monitoring | Detector Monitoring |   | 0.03 |   |  |   |  | 0.03 |  |
|  | Online Filter | Online filter development & testing (Low-up filter) |   | 0.20 |   |  |   |  | 0.20 |  |
| **IN, SEONGJUN Total** |  |  | **0.23** |  |  |  |  | **0.23** |  |
| Dujmovic, Hrvoje  | Detector Monitoring | Detector Monitoring |   | 0.03 |   |  |   |  | 0.03 |  |
| Online Filter | Online filter development & testing (Full Sky Starting Filter) |   | 0.20 |   |  |   |  | 0.20 |  |
| **Dujmovic, Hrvoje Total** |  |  | **0.23** |  |  |  |  | **0.23** |  |
| Minjin Jeong | Detector Monitoring | Detector Monitoring |   | 0.03 |   |  |   |  | 0.03 |  |
| Detector Calibration | Anisotropy Measurement with Spice hole camera |   |  |   |  |  |  0.35 | 0.35 |  |
| **Jeong Minjin Total** |  |  | **0.03** |  |  |  | **0.35** | **0.38** |  |
| Woosik Kang | Detector Monitoring | Detector Monitoring |   | 0.03 |   |  |   |  | 0.03 |  |
|  | Ice Properties | Photon tracking / ice-properties calibration |  |  |  |  |  | 0.20 | 0.20 |  |
| **Woosik Kang Total** |  |  | **0.03** |  |  |  | **0.20** | **0.23** |  |
| **SUNGKYUNKWAN Total** | **0.30** | **0.80** |  |  |  | **0.75** | **1.85** |  |

**Faculty:**

Carsten Rott – BSM-wg co-lead, outreach, Speakers committee member.

**Scientists and Post Docs:**

Christoph Toennis - Ice-property studies and reconstruction tools delayed light from bright cascades (echo method),

 Analysis topics: Search for secluded dark matter from the Sun. ANTARES-IceCube joined Dark matter analyses

**Ph.D. Students:**

Seongjin In - Detector monitoring, online filter development and testing 20% , maintains the LowUP Filter. Neutrino spectra for dark matter searches

 Thesis topic: Solar WIMP search using energy spectral information with IceCube/DeepCore.

Minjin Jeong - Monitoring, Analysis of camera data for the study of ice- properties and Anisotropy Measurement with Spice hole camera. Thesis topic: Search for Dark Matter from Galaxy Clusters

Woosik Kang - Monitoring, Hole-ice and ice-property studies. Swedish camera simulations

Hrvoje Dujmovic - Monitoring, maintenance of the FullSkyStarting Filter (FSS). Thesis topic: Search for dark matter decay.

**Diploma/Master Students:**

Hyoungkoo Kim - Monitoring. GEANT4 simulations (50% IceCube)

JongHyun Kim - Monitoring, Genie simulation studies. Neutrino Oscillation Tomography.

**Description of planned analysis:**

The SKKU group will focus on analyses involving data from DeepCore and physics feasibility studies for future dark matter and neutrino oscillation spectrometry analyses. The PhD student thesis topics are Solar dark matter and solar atmospheric neutrino searches using energy spectral information, and searches for high mass dark matter decays.

**Description of Service work**

The SKKU group will maintain and develop filters related to DeepCore and dark matter analyses. We will investigate hole ice properties with the goal to advance our understanding of individual DOMs and their local ice environment in studies using down-going muons and flasher data.