**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 |  | |
| **Woosik Kang Total** | | |  |  | | **0.03** | |  | |  | | |  |  | | | **0.03** |  | |
| **SUNGKYUNKWAN Total** | | | | | **0.30** | | **0.80** | |  | |  | | |  | **0.55** | | | **1.82** |  | |

**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: Solar WIMPs / Solar Atmospheric Neutrinos / 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. Thesis topic: Search for energetic neutrinos from the Sun (secluded dark matter / solar atmospheric neutrinos)

Woosik Kang - Monitoring, Hole-ice and ice-property studies. (50% IceCube). Swedish camera simulation

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

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

**Diploma/Master Students:**

Hyoungkoo Kim - Monitoring, Hole-ice and ice-property studies. (50% IceCube)

**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 WIMP searches using energy spectral information with DeepCore and searches for high mass dark matter decays.

**Description of Service work**

The SKKU group will maintain and develop filters related to DeepCore and WIMP 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.