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

**Universität Mainz**

**Lutz Köpke/Sebastian Böser**

**Ph.D Scientists** (Faculty Scientist/Post Doc Grads): **3** (2 1 5)

**Scope of Work**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Labor Cat.** | **Names** | | **WBS L3** | **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 | BÖSER, SEBASTIAN | | Administration | Upgrade R&D module coordinator | |  | 0.2 |  |  |  |  | 0.2 |
|  | **BÖSER; SEBASTIAN Total** | | |  | |  | **0.2** |  |  |  |  | **0.2** |
| KE | KÖPKE,  LUTZ | | Administration | SN group co-chair | |  | 0.15 |  |  |  |  | 0.15 |
| **Köpke; Lutz Total** | | |  | |  | **0.15** |  |  |  |  | **0.15** |
| GR | EHRHARD, THOMAS | | Software | SimProd setup and PISA | |  |  | 0.25 |  |  |  | 0.25 |
|  | **EHRHARD, THOMAS Total** | | | | |  |  | **0.25** |  |  |  | **0.25** |
|  | SANDROOS, JOAKIM | | Software | PISA | |  | 0.20 |  |  |  |  | 0.20 |
|  | **SANDROOS, JOAKIM Total** | | |  | |  | **0.20** |  |  |  |  | **0.20** |
|  | LOHFINK, ELISA | | Reconstruction | | Low energy reco. |  |  |  |  | 0.40 |  | 0.40 |
|  | **LOHFINK, ELISA Total** | | | | |  |  |  |  | **0.40** |  | **0.40** |
|  | WELDERT, JAN | | Software | | PISA |  | 0.20 |  |  |  |  | 0.20 |
|  | WELDERT, JAN Total | | | | |  | 0.20 |  |  |  |  | 0.20 |
|  | FRITZ, ALEXANDER | | Detector Monitoring | | SuperNova Operations |  | 0.40 |  |  |  |  | 0.40 |
|  | **FRITZ, Alexander Total** | | | | |  | **0.40** |  |  |  |  | **0.40** |
|  | UM GR | Detector Monitoring | | Detector Monitoring | |  | 0.05 |  |  |  |  | 0.05 |  |
|  | **UM Monitoring Total** | | |  | |  | **0.05** |  |  |  |  | **0.05** |
|  | UM GR | E&O | | I3 virtual reality | | 0.25 |  |  |  |  |  | 0.25 |
|  | **UM Education and Outreach total** | | |  | | **0.25** |  |  |  |  |  | **0.25** |
| **UM Total** | | |  |  | | **0.25** | **1.45** |  |  | **0.4** |  | **2.1** |

**Gen-2 tasks:**

|  |  |  |
| --- | --- | --- |
| **Name** | **Task** | **FTE** |
| Sebastian Böser | WOM development | 0.2 |
| Lutz Köpke | Calibration sensors | 0.2 |

**Postdoc:**

Anna Steuer – WOM hardware activities (not funded via IceCube)

**Ph.D. Students:**

Alexander Fritz - SNDAQ development

Thesis/Analysis topic: To be decided

Elisa Lohfink - Low energy reconstruction

Thesis/Analysis topic: To be decided

Thomas Ehrhard - PISA development

Non-standard neutrino interactions with DeepCore

Joakim Sandroos - Neutrino cross section systematics, low energy filter

Thesis/Analysis topic: Measurement of the atmospheric neutrino flux

with DeepCore

Jan Weldert - PISA development, Low-energy reconstruction

Thesis/Analysis topic: To be decided

**Computing Resources**

|  |  |  |
| --- | --- | --- |
|  | **2019** | |
|  | CPU Cores | GPU Cards |
| **IceCube** | Cluster upgrade:  ~ 1000 Cores for IceCube-Gen2 | Cluster upgrade:  ~ 300 GPUs for IceCube-Gen2 |
| **PINGU** |
| **HEA** |

While the resources exclusively allocated for IceCube are small, a very large pool of shared resources can and are being used, mostly for IceCube analysis (CPUs) and PINGU analysis (GPUs). With the recent increase in computing fascilities (Mogon-II), a significant increase in resources (both dedicated to IceCube as well as shared) is available.

Currently available GPU types:

* GTX680
* GTX Titan
* Tesla K20
* GTX480

Currently available CPU types

* Intel Xeon E5-2620
* Intel Xeon 5530