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

**Scope Of Work**

**Universität Dortmund**

**Wolfgang Rhode**

**Ph.D Scientists** (Faculty Scientist/Post Doc Grads): **2** (1 1 6)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Labor Cat.** | **Names** | **WBS L3** | **Tasks** | **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 |
| SC | RUHE, TIM | Physics Filters | Physics filters |  |  |  | 0.20 |  | 0.20 |
|  | **RUHE, TIM Total** | |  |  |  |  | **0.20** |  | **0.20** |
| CS | PIELOTH, DAMIAN | Computing Resources | Coordinate GRID computing in Germany |  |  | 0.25 |  |  | 0.25 |
|  | **PIELOTH, DAMIAN Total** | |  |  |  | **0.25** |  |  | **0.20** |
| GR | DTMD GR | Detector Monitoring | Detector Monitoring |  | 0.03 |  |  |  | 0.03 |
|  | BÖRNER, MATHIS | Simulation Production | Simulation production site manager at Dortmund |  |  | 0.30 |  |  | 0.30 |
|  | MENNE, THORBEN | Physics Filters | Physics filters |  |  |  | 0.20 |  | 0.20 |
|  | FUCHS, TOMASZ | Simulation Programs | PROPOSAL-IceProd integration and maintenance/support |  |  |  |  | 0.50 | 0.50 |
|  | SCHLUNDER,  PHILLIPP | Physics Filters | Physics Filters |  |  |  | 0.20 |  | 0.20 |
|  | SANDROCK,  ALEXANDER | Simulation  Programs | PROPOSAL-IceProd  Integration and optimization |  |  |  |  | 0.50 | 0.50 |
|  | MEIER,  MAXIMILIAN | Physics Filters | Physics Filters |  |  |  | 0.20 |  | 0.20 |
|  | **Ph.D. Students Total** | |  |  | **0.03** | **0.30** | **0.60** | **1.00** | **1.93** |
| **DTMND Total** | |  |  |  | **0.03** | **0.55** | **0.80** | **1.00** | **2.38** |

**Faculty:**

Wolfgang Rhode

**Scientists and Postdocs:**

Tim Ruhe  Filtering WBS 2.4 with 0.2 FTE

Analysis topics: Machine learning and two dimensional unfolding of various signals

**PhD Students (100% IceCube):**

Thorben Menne  Filtering WBS 2.4 with 0.2 FTE

Thesis/Analysis topics: Spectral unfolding of the signal from stacked source positions

Mathis Börner  Local MC Production WBS 2.3 with 0.3 FTE

Thesis/Analysis topics: Machine learning for filtering and high quality sample definition and spectral unfolding of the signal from atmospheric muon neutrinos.

Tomasz Fuchs  2.5 PROPOSAL integration with 0.5 FTE

Thesis/Analysis topics: Simulation and analysis of HE atm. muon interactions in PROPOSAL, investigation of the corresponding systematic uncertainties. Thesis ending in autumn.

Phillipp Schlunder 🡪 Filtering WBS 2.4 with 0.2 FTE

Thesis/Analysis Topics: Machine learning for filtering with DeepCore and high quality sample definition and spectral unfolding of atmospheric muon neutrinos with DeepCore

Alexander Sandrock 🡪 PROPOSAL Optimization and integration WBS 2.4 with 0.5 FTE

Thesis/Analysis Topics: High accuracy computation of cross sections and muon energy losses and integration in PROPOSAL

Maximilian Meier 🡪 Filtering WBS 2.4 with 0.2 FTE

Thesis/Analysis Topics: Machine Learning and high quality sample definition for tau neutrino searches.

**General:**

The Dortmund group uses local resources (LiDO, PhiDO, DGRZR) for IceCube Monte Carlo production.

**Computing Resources:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 2016 | | 2017 | |
|  | CPU Cores | GPU Cards | CPU Cores | GPU Cards |
| IceCube | 2642 | 10 | 2304 | 50 |
| PINGU | --- | --- | --- | --- |
| Gen2 | --- | --- | --- | --- |

**Note: The Computing resources summarized in this table are the total of what is available in Dortmund. CPU and GPU may also be used for PINGU and Gen2 and can be shared between the individual experiments as needed.**