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

**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 | Van Eijndhoven Nick | Reconstruction  | IcePack analysis software tools |   |   |   |   |  0.25 |  | 0.25 |
| Engineering and R&D Support | self-veto techniques for Icecube-Gen2 | 0.25 |   |   |   |  |  | 0.25 |
| **Van Eijndhoven Nick total** |  | **0.25** |  |  |  | **0.25** |  | **0.50** |
| De Clercq Catherine | Administration | Institutional Lead | 0.20 |   |   |   |   |  | 0.20 |
| **De Clercq Catherine total** |  | **0.20** |  |  |  |  |  | **0.20** |
|     PO | De Vries, Krijn | Engineering and R&D Support | Radio/radar detection for IceCube-Gen2 | 0.25 |   |   |   |  |  | 0.25 |
|  | **De Vries, Krijn Total** |  | **0.25** |  |  |  |  |  | **0.25** |
|  | Jan Lünemann | Engineering and R&D Support | self-veto techniques for Icecube-Gen2 | 0.25 |  |  |  |  |  |  0.25 |
|   | **Jan Lünemann Total** |  | **0.25** |  |  |  |  |  | **0.25** |
| VUB PO | Detector Monitoring | Detector Monitoring |   | 0.06 |   |   |   |  | 0.06 |
|   | **VUB PO Total** |  |  | **0.06** |  |  |  |  | **0.06** |
| GR | De Wasseige, Gwenhael | Real-Time Alerts | Optimization of hitspooling for SN and solar flares |  | 0.10 |  |  |  |  | 0.10 |
|  |  | Education and Outreach | Education and Outreach | 0.10 |  |  |  |  |  | 0.10 |
|  |  | IceTop operations | Commissioning of snow sensor |  | 0.50 |  |  |  |  | 0.50 |
|  | **De Wasseige, Gwenhael, Total**  |  | **0.10** | **0.60** |  |  |  |  | **0.70** |
|  | Maggi, Giuliano | Reconstruction  | muon track reconstruction in IceCube and DeepCore |  |  |  |  | 0.25 |  | 0.25 |
|   | **Maggi, Giuliano Total** |  |  |  |  |  | **0.25** |  | **0.25** |
|   | VUB GR | Detector Monitoring | Detector Monitoring |   | 0.06 |   |   |   |  | 0.06 |
|   | **VUB GR Total** |  |  | **0.06** |  |  |  |  | **0.06** |
| **VUB Total**  |  | **1.05** | **0.72** |  |  | **0.50** |  | **2.27** |

**Vrije Universiteit Brussel**

**Catherine de Clercq**

**Ph.D Scientists** (Faculty Scientist/Post Doc Grads): **4** (2 2 2)

**Note: Gen-2 contributions not relevant to IceCube M&O are highlighted in blue** (Total: 0.75 FTE)

**Faculty:**

Catherine de Clercq Institutional Lead

Nick Van Eijndhoven IceCube analysis software tools (IcePack framework),

GEN2 geometry optimization

**Scientists/post-docs:**

De Vries, Krijn R&D on radio/radar detection

Analysis topics: GRB/AGN analysis

Jan Lünemann Optimization of the geometry and the track reconstruction, and GEN2 geometry optimization

Analysis topics: Development of a hybrid reconstruction for EHE (GZK) events using the In-Ice part of IceCube and the radio detectors

**Ph.D. Students:**

Maggi Giuliano Muon track reconstruction in IceCube and DeepCore

                 Analysis topics: AGN analysis

 Thesis topic: Search for high-energy neutrinos from dust-obscured Active Galactic Nuclei

Gwenhael De Wasseige – Optimization of hitspooling for SN and solar flares, Education and Outreach, commissioning of the IceTop Snow Sensors

Analysis topics: Solar flares

 Thesis topic: Search for neutrinos from solar flares

**Diploma/Master Students:**

**Computing Resources**

**IIHE (ULB-VUB)**

|  |  |  |
| --- | --- | --- |
|  | **2016** | **2017** |
|  | **CPU Cores**  | **GPU Cards** | **CPU Cores** | **GPU Cards** |
| **IceCube**  |  | 14 | Up to 1000 | 14 |
| **PINGU** |  |  |  |  |
| **Gen2**  |  |  |  |  |

The computing resources in the table are provided by the IIHE (ULB-VUB), i.e. by ULB and VUB together.

The 14 GPU cards are presently used for the production of MC samples for the collaboration. The jobs are launched centrally. From our side we cannot see whether the jobs run for IceCube, PINGU or Gen2.

The CPU cores are used for the production of MC samples by the collaboration. In the course of 2017 up to a max of 1000 cores might be made available.

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