**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 |
| Administration | Institutional co-lead | 0,10 |  |  |  |  |  | 0,10 |
| Engineering and R&D Support | self-veto techniques for Icecube-Gen2 | 0.25 |   |   |   |  |  | 0.25 |
| **Van Eijndhoven Nick total** |  | **0.35** |  |  |  | **0.25** |  | **0.60** |
| 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** |
|  | VUB PO | Detector Monitoring | Detector Monitoring |   | 0.06 |   |   |   |  | 0.06 |
|   | **VUB PO Total** |  | **0.25** | **0.06** |  |  |  |  | **0.31** |
| 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** |
|  |  |  |  |  |  |  |  |  |  |  |
|   |  |  |  |  |  |  |  |  |  |
|   | VUB GR | Detector Monitoring | Detector Monitoring |   | 0.06 |   |   |   |  | 0.06 |
|   | **VUB GR Total** |  | **0.10** | **0.66** |  |  |  |  | **0.76** |
| **VUB Total**  |  | **0.90** | **0.72** |  |  | **0.25** |  | **1.87** |

**Vrije Universiteit Brussel**

**Catherine de Clercq**

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

**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 Institutional co-lead

 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

**Ph.D. Students:**

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

Analysis topic: Solar flares

 Thesis topic: Search for neutrinos from solar flares

 Paul Coppin starts on 1 October 2017 - service tasks to be defined

 Analysis topic: GRB analysis

 Thesis topic: Precursor and afterglow analysis of GRBs

 Pablo Correa starts on 1 October 2017 – service tasks to be defined

 Analysis topic: AGN analysis

 Thesis topic: Dust obscured and ultra-luminous infrared galaxies

**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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