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

**Scope Of Work**

**Université Libre de Bruxelles**

**Juan Antonio Aguilar Sánchez**

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | Aguilar Sánchez, Juan Antohio | Administration | Beyond Standard Model WG co-Chair | 0.25 |  |   |  |   |  | 0.25 |
|  | Administration | Institutional Lead | 0.20 |   |   |   |  |  | 0.20 |
|  | Administration | Member of PubCom | 0.20 |  |  |  |  |  | 0.20 |
| Education and Outreach | Masterclass  | 0.05 |  |  |  |  |  | 0.05 |
| Maris, Ioana (0.4 FTE) | Engineering and R&D support | SiPM characterization | 0.10 |  |  |  |  |  | 0.10 |
| Detector Monitoring | Monitoring Shifters | 0.05 |  |  |  |  |  | 0.05 |
| Toscano, Simona | Education and Outreach | Masterclass  | 0.05 |  |  |  |  |  | 0.05 |
| Engineering and R&D support | Hybrid detection Radio/In-Ice | 0.10 |  |  |  |  |  | 0.10 |
| Administration | Member of PubCom | 0.20 |  |  |  |  |  | 0.20 |
| Faculty Total |  | **1.2** |  |  |  |  |  | **1.2** |
| PO | Baur, Sebastian | Public Data Products  | Validation of data release Upgrade |  |  |  | 0.25 |  |  | 0.25 |
| Education and Outreach | Masterclass  | 0.10 |  |  |  |  |  | 0.10 |
| Mockler, Daniela | Surface detector operations | Validation between SLC signals and MC |  | 0.10 |  |  |  |  | 0.10 |
|  | **PO Total** |  | **0.1** | **0.1** |  | **0.25** |  |  | **0.45** |
| GR | ULB GR | Detector Monitoring | Monitoring Shifters |  | 0.12 |  |  |  |  | 0.12 |
|  | Renzi, Giovanni | Online Filter (Pnf) | Vertical event filter, WIMP L2 |  | 0.20 |  |  |  |  | 0.20 |
|  | Iovine, Nadège | Detector Monitoring | IceTop Snow Monitor |  | 0.20 |  |  |  |  | 0.20 |
|  | **ULB GR Total** |  |  | **0.52** |  |  |  |  | **0.52** |
| **ULB Total** |  |  | **1.30** | **0.62** |  | **0.25** |  |  | **2.17** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Labor Cat.** | **Names** | **WBS L3** | **Tasks** | **WBS 1.1** | **WBS 1.2** | **WBS 1.3** | **WBS 1.4** | **WBS 1.5** | **WBS 1.6** | **Grand Total** |
| Project Office | Gen2 Enhanced Water drill | Deep Ice Sensor Modules | CMT | Characterization & Calibration | M&O Data Systems |
| PO | Baur, Sebastian | Public Data Products  | Validation of data release Upgrade |  |  |  | 0.25 |  |  | 0.25 |
| Mockler, Daniela | Surface detector | Validation between SLC signals and MC |  | 0.10 |  |  |  |  | 0.10 |
|  | **PO Total** |  |  | **0.1** | **0** | **0.25** | **0** | **0** | **0.35** |
| **ULB Total** |  |  | **0** | **0.1** | **0** | **0.25** | **0** | **0** | **0.35** |

**Faculty (3):**

Juan Antonio Aguilar – Local PI. BSM searches, dark matter, astrophysical neutrinos

Ioana Maris – 0.5 FTE Cosmic Ray analysis and R&D for Surface Veto

Simona Toscano – Radio activities - Hybrid detection, ARA, RNO

**Scientists/post-docs (2):**

Sebastian Baur – Dark Matter searches with IceCube, neutrino lines search. Event selection studies for the IceCube Upgrade.

Daniela Mockler – IceTop Upgrade, characterization of SiPMs for the scintillators.

**Graduate Students (2):**

Nadège Iovine – IceTop Snow Monitor

 Thesis/Analysis topics: Dark matter from the Galactic Center

Giovani Renzi – Vertical event filter and WIMPreader

 Thesis/Analysis topics: Analysis on earth wimps dark matter

**Computing Resources**

**IIHE (ULB-VUB)**

|  |  |  |
| --- | --- | --- |
|  | **2017** | **2018** |
|  | **CPU Cores**  | **GPU Cards** | **CPU Cores** | **GPU Cards** |
| Pledged resources in the IceCube common cluster | Up to 1000 | 14 | Up to 1000 | 14 |

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

The 14 GPU cards 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 or Gen2.

The CPU cores are used for the production of MC samples by the collaboration. In the course of 2018 up to a max of 1000 cores may be made available.

The person to contact for technical information is Olivier: Olivier.devroede@vub.be