**UW–Madison QuarkNet Center**

**2013-2014 Annual Report**

The QuarkNet efforts at UW–Madison are led by the Wisconsin IceCube Astrophysics Center (WIPAC). Prof. Justin Vandenbroucke is the PI, and the team includes Prof. Jim Madsen, IceCube Associate Director for Education and Outreach, and Dr. Silvia Bravo, Outreach Specialist at WIPAC.

The **QuarkNet program @ WIPAC** included three activities this year.

i) **IceCube Masterclass at WIPAC**, held on May 21 in Madison. WIPAC led the first IceCube Masterclass held at five different IceCube institutions in the US and Europe. In Madison, 28 students from seven high schools in the Madison area attended the masterclass. Teachers Juan Botella and Jim Reichling also participated.

Budget considerations: there are no budget expenses associated with this activity.

ii) ***Astrophysics in the Classroom*:** a workshop for high school teachers, held on July 18 in Madison. This was the second edition of a summer workshop for high school teachers. The program ran from 9 am to 5 pm. Three teachers participated and one canceled due to a last minute family issue. Participating teachers: Juan Botella, Edith G. Fork and Erin Treder.

Budget considerations: participating teachers will receive a stipend of $100 each.

iii) **Teacher internship: Curriculum development for a distributed electronic cosmic-ray observatory, the DECO app**. The activity started on September 11, 2014, and will continue until the end of October, or later depending on the availability of the participating teachers. Prof. Vandenbroucke is leading the DECO project, which is creating an app that turns a cell phone into a cosmic-ray detector. After some months focusing on development, the app is now ready to be used in formal and non-formal learning environments. We are working with two teachers in the Madison area: Lisa Stec teaches AP Physics, with content that includes particle physics; and Juan Botella teaches an astronomy course and is willing to broaden it's scope from optic to particle telescopes. After our first meeting, Lisa committed to helping in the development of a few-hours activity that will link particle physics to astrophysics and include use of the DECO app to allow students to make some measurements of cosmic rays. Juan committed to a longer activity, with measurements taken over the course of a few weeks, that will allow students to understand how the detector (the cell phone) works and to design and perform a small research activity, including data analysis.

Budget considerations: this is still an ongoing activity, but teachers have committed to the following hours: Lisa Stec up to 40 hours, equivalent to 5 days of 8 working hours; and Juan Botella up to 32 hours, equivalent to 4 days of 8 working hours. Both of them will come to WIPAC to work on the project, but the hours will be distributed in sessions of 2-3 hours. WIPAC will keep a register of the hours devoted to the project by each teacher. Estimated budget is $900.

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**2013-2014 Budget**

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| --- | --- | --- |
| Activity | Description | QuarkNet Funding |
| 2014 IceCube Masterclass | Pilot Activity | Not Funded |
| 2014 Summer Teacher Workshop | 3 teachers attended, full-day workshop | $300  |
| Teacher internship for DECO\* | 1 teacher working 5 days, and another teacher working 4 days  | $900 |

\* Ongoing activity. Estimated budget reflects teachers’ committed time. To be reviewed once the activity is finished.