**THE PHYSICS COLLOQUIUM**

Thursday, 23 June 2022, 4:00 p.m.

ONLINE

**Multi-messenger studies   
to explore cosmic ray sources**

Damien Dornic  
*Centre de Physique des Particules de Marseille (CPPM*

The interdisciplinary study of both the infinitely small (particles) and infinitely large (astronomy/astrophysics) allows us to tackle the physic laws in the Universe. The study of the cosmic particles is a keystone to understand the physical processes occurring in astrophysical sources such as in active galactic nuclei (AGN), in gamma-ray bursts (GRB which are the most powerful persistent and transient emitters of electromagnetic radiation in the Universe.

AGN dominate the high-energy extragalactic sky and are then considered as one of the major sources of very high-energy cosmic rays. The best way to determine unambiguously the origin of cosmic rays is the detection of neutrinos that are due to hadronic processes.

In this seminar, I will describe the panorama of the main results of the neutrino astronomy nowadays with the IceCube and ANTARES neutrino telescopes and emphasize the major roles played by the multi-messenger and multi-wavelength concomitant observations in these discoveries. I will finish by drawing some perspectives with the forthcoming instruments KM3NeT, SVOM, LSST, CTA, SKA....

*Join us for coffee starting 3:30 p.m. Refreshments will be served after the lecture.*

*For more information contact the host: Manuela Vecchi (*[*m.vecchi@rug.nl*](mailto:m.vecchi@rug.nl)*)   
Website: http://www.rug.nl/research/vsi/colloquia/*

*To join online:* <https://eu.bbcollab.com/guest/d3e78ff0ed6444489e606b4cd8c26617>