

THE PHYSICS COLLOQUIUM

Thursday 25 May 2023, 4:00 p.m.
Nijenborgh 4, **Lecture Hall 5111.0080**

Detecting ultra-high-energy neutrinos using radio techniques

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Astrophysical neutrinos are a very important part of multi-messenger astronomy. They are created in extreme physical environments, and because they are not charged, they point back to their sources. They are, however, notoriously difficult to detect due to their extremely low flux.

The way to combat this problem is to build a large enough detector. Modern experiments aiming to detect neutrinos often make use of the fact that ice is essentially transparent to radio waves. If an ultra-high-

energy (UHE) neutrino interacts in ice generating a particle cascade, it can be detected using radio methods. The cascade generates radio emission, creating a detectable signal.

The cascade can also be used to reflect radio waves using radar techniques. The fact that radio waves are not absorbed in ice means a very large area can be monitored, producing a large enough detection volume to see UHE neutrinos.

In this talk, I will give an overview of the state of neutrino astronomy and discuss two new neutrino detection experiments that are currently being built: Radio Neutrino Observatory-Greenland (RNO-G) and the Radar Echo Telescope (RET).

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

For more information contact the host: Andrea Giuntoli (a.giuntoli@rug.nl)

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