

FAKULTÄT für PHYSIK  
LUDWIG-MAXIMILIANS-UNIVERSITÄT  
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT  
TECHNISCHE UNIVERSITÄT MÜNCHEN  
MÜNCHEN/GARCHING

## Garching Maier-Leibnitz-Kolloquium

Donnerstag, 01.06.2023, 16<sup>15</sup> Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1  
Treffen zum gemeinsamen Kaffee 16 Uhr

**Dr. Chiara Bellenghi**

(Physik Department E49, Technische Universität München)

### Evidence for neutrino emission from the nearby active galaxy NGC 1068

The quest for the sources of the highest energy cosmic radiation is closely connected with the search for the production sites of high-energy astrophysical neutrinos, generated in cosmic ray interactions. In this pursuit, the IceCube Neutrino Observatory has been playing a leading role for over a decade, from the detection of hundreds of astrophysical neutrinos with energies reaching above the PeV, which marked the birth of high-energy neutrino astrophysics, to the identification of the blazar TXS 0506+056 as the first flaring extragalactic neutrino source candidate. Recently, an improved, more accurate analysis technique developed within the IceCube collaboration was used to search the northern sky for neutrino emission using  $\sim 9$  years of re-calibrated data collected between 2011 and 2020. We searched for neutrino emission from 110 astrophysical objects known for being gamma-ray emitters and found the strongest clustering of neutrinos of high-energy neutrinos at the location of the Seyfert 2 galaxy NGC 1068, which shows evidence for neutrino emission at the  $4.2 \sigma$  level. After TXS 0506+056, NGC 1068 is the second extragalactic source of high-energy neutrinos, indicating that more than one population of sources contributes to the observed diffuse cosmic neutrino flux.

*Hybrid online access via ZOOM:*

<https://lmu-munich.zoom.us/j/98457332925?pwd=TWc3V1JkSHpyOTBPQVlMelhuNnZ1dz09>

Meeting ID: 984 5733 2925

Passcode: 979953

gez. Peter Thirolf  
Tel. 289-14064

gez. Norbert Kaiser  
Tel. 289-12367