THE PHYSICS COLLOQUIUM

Thursday 12 November 2026, 4:00 p.m.
Nijenborgh 4, Lecture Hall **5111.0080**

Do we understand cosmic structure growth and the early universe? Insights from mapping mass and velocity in our universe with the CMB

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One of the most powerful tests of our cosmological model, and of new physics beyond it, is to check whether cosmic structure grows with time as predicted. I will begin with



a brief introduction to the gravitational lensing of the cosmic microwave background (CMB), which lets us map the distribution of matter in the universe and hence probe how structure has grown. Motivated by several intriguing discrepancies in structure growth and neutrino mass measurements, I will discuss recent and upcoming CMB lensing results from the Atacama Cosmology Telescope (ACT) and the Simons Observatory and what they mean for our cosmological model.

In the second part of the talk I will present measurements of a new cosmological probe: the cosmic velocity field, reconstructed from the kinetic Sunyaev-Zel'dovich (kSZ) effect. After showing our first detections of this signal with ACT, I will explain why velocity maps will open a new window onto the physics of the early universe.

Join us for coffee starting 3:30 p.m. Refreshments will be served after the lecture.
For more information contact the host: Daan Meerburg (p.d.meerburg@rug.nl)
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