



# KCETA Colloquium

## High-precision measurement of the W boson mass at CMS

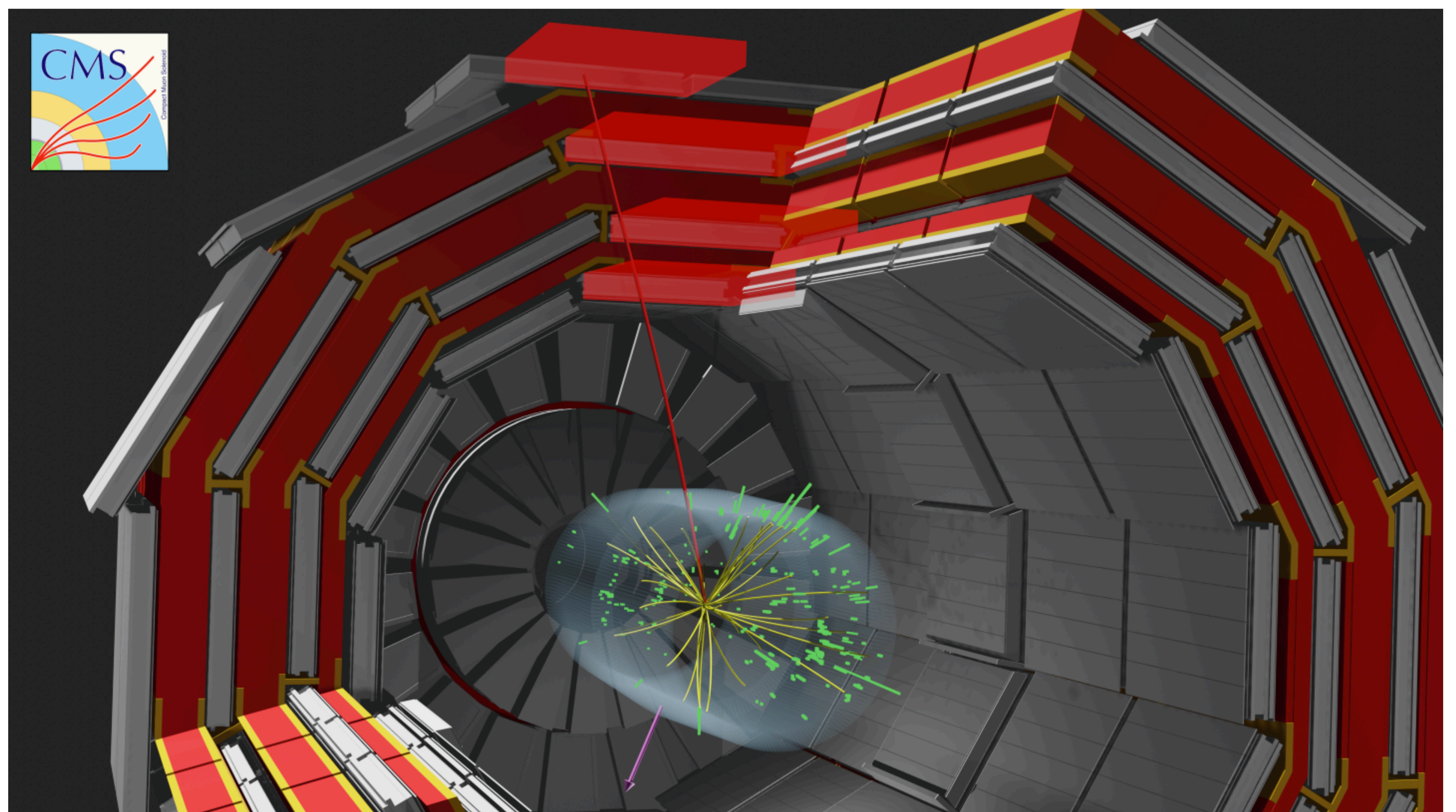
**Thursday, Dec. 5, 2024**

**Kleiner Hörsaal A (CS) 15:45 - 17:00**

**Dr. Jan Eysermans**  
(MIT)

The W boson mass is measured using proton-proton collision data with an integrated luminosity of  $16.8 \text{ fb}^{-1}$ , collected by the CMS experiment in 2016. The mass is extracted through a fit to a highly granular two-dimensional distribution of transverse momentum ( $p_T$ ) and pseudorapidity ( $\eta$ ) in a sample of  $W \rightarrow \mu\nu$  decays, categorized by charge.

This novel approach, which incorporates significant in-situ constraints on theoretical inputs and their associated uncertainties and precise determinations of experimental effects, yields a highly accurate W boson mass measurement of  $80\,360.2 \pm 9.9 \text{ MeV}$ , consistent with the Standard Model prediction.



**Please note:**

The colloquium will also be live-streamed to B401 SR410 (CN).

KIT Center Elementary Particle and Astroparticle Physics (KCETA)  
[www.kceta.kit.edu](http://www.kceta.kit.edu)